SOCIAL IMPACT ASSESSMENT

FOR

GRID CONNECTION INFRASTRUCTURE

FOR

BULSKOP PHOTOVOLTAIC SOLAR ENERGY CLUSTER

WESTERN CAPE PROVINCE

OCTOBER 2021

Prepared for

ATLANTIC ENERGY

by

Tony Barbour and Schalk van der Merwe

Tony Barbour
ENVIRONMENTAL CONSULTING AND RESEARCH

10 Firs Avenue, Claremont, 7708, South Africa
(Tel) 27-21-797 1361 - (Fax) 27-21-797 1361- (Cell) 082 600 8266
(E-Mail) tbarbour@telkomsa.net

EXECUTIVE SUMMARY

INTRODUCTION AND LOCATION

Bulskop Grid (Pty) Ltd proposes the construction and operation of grid connection infrastructure for the proposed Bulskop PV SEF cluster consisting of six 120 MW facilities[1] located to the south of Beaufort West in the Western Cape Province. A grid connection corridor of approximately 300 m wide and 17.5 km long running an east-west direction from Bulskop collector substation/ switching station in the east to the Droerivier Main Transmission Substation (MTS) in the west is proposed.

This report contains the findings of the Social Impact Assessment (SIA) Report undertaken as part of the BA process for the proposed grid infrastructure.

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.

FIT WITH POLICY AND PLANNING

The findings of the SIA indicate that investment in renewable energy and the associated energy infrastructure is strongly supported at a national, provincial, and local level. The development of and investment in renewable energy and associated energy distribution infrastructure is supported by the National Development Plan (NDP), New Growth Path Framework and National Infrastructure Plan, which all highlight the importance of energy security and investment in energy infrastructure. The development of renewable energy is also supported by the BWM IDP and SDF.

The proposed site is also located within the Beaufort West REDZ and Central Transmission Corridor. The area has therefore been identified as suitable for the establishment of large-scale solar energy facilities and associated transmission infrastructure. The development of the proposed grid connection infrastructure is therefore supported by key policy and planning documents.

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.

[1] Bulskop, Rosenia, Hoodia, Salsola, Gamka and Hardeveld PV SEFs.

The construction phase will extend over a period of approximately 12 months and create in the region of 60 employment opportunities. The total wage bill will be in the region of R 10 million (2021 Rand values). Most of the low and semi-skilled employment opportunities are likely to benefit residents from Beaufort West the majority of whom are likely to be historically disadvantaged (HD) members of the community. This would represent a short term positive social benefit in an area with limited employment opportunities. A percentage of the wage bill will be spent in the local economy which will also create opportunities for local businesses in Beaufort West.

The capital expenditure associated with the construction of grid connection infrastructure will create opportunities for local companies and the regional and local economy. The sector of the local economy most likely to benefit from the proposed development is the local service industry. The potential opportunities for the local service sector would be linked to accommodation, catering, cleaning, transport, and security, etc. associated with the construction workers on the site.

Potential negative impacts

- Impacts associated with the presence of construction workers on local communities.
- Noise, dust, and safety impacts of construction related activities and vehicles.
- Risks posed to farming activities by construction workers.

The findings of the SIA indicate that the significance of the potential negative impacts is likely to be negligible. With mitigation they are rated as Low Negative. The potential negative impacts associated with the proposed transmission lines and substations 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	Low (Negative)	Low (Negative)
Impact of construction activities and vehicles	Low (Negative)	Low (Negative)
Safety risk, stock theft and damage to farm infrastructure associated with presence of construction workers	Low (Negative)	Low (Negative)

OPERATION PHASE

The benefits associated with the Bulskop PV SEF Cluster are dependent upon being able to connect to the national grid.

The key social issues associated with the operational phase include:

Potential positive impacts
- Improve energy security and establishment of energy infrastructure.
- Creation of employment opportunities.

Potential negative impacts
- The visual impacts and associated impact on sense of place.
- Risks posed to farming activities by maintenance workers.

The findings of the SIA indicate that the significance of the potential negative impacts is likely to be negligible. With mitigation they are rated as Low Negative. The potential negative impacts associated with the proposed transmission lines and substations can therefore be effectively mitigated if the recommended mitigation measures are implemented.

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
Improve energy security and establishment of energy infrastructure	High (Positive)	High (Positive)
Creation of employment and business opportunities during maintenance	Low (Positive)	Low (Positive)
Visual impact and impact on sense of place	Low (Negative)	Low (Negative)
Safety risk, stock theft and damage to farm infrastructure associated with presence of maintenance	Medium (Negative)	Low (Negative)

CUMULATIVE IMPACTS

Cumulative impact on sense of place

There are a number of other power lines located and proposed in the vicinity of the grid connection infrastructure. The potential for cumulative impacts associated with combined visibility (whether two or more power lines will be visible from one location) and sequential visibility (e.g., the effect of seeing two or more power lines along a single journey, e.g., road or walking trail) does therefore exist. The site is however located within the Beaufort West REDZ and Central Transmission Corridor. The area

has therefore been identified as suitable for the establishment of the renewable energy facilities and associated grid infrastructure.

Cumulative impact on local services and accommodation
The significance of this impact with mitigation was rated as Low Negative.

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

NO-DEVELOPMENT OPTION

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

CONCLUSION

The energy security benefits associated with the proposed Bulskop PV SEF Cluster are dependent upon it being able to connect to the national grid via the establishment of grid connection infrastructure.

The findings of the SIA indicate that the significance of the potential negative social impacts associated with the grid infrastructure for the Bulskop PV SEF Cluster for both the construction and operational phase are Low Negative with mitigation. The potential negative impacts can therefore be effectively mitigated if the recommended mitigation measures are implemented.

The site is also located within the Beaufort West REDZ and Central Transmission Corridor. The area has therefore been identified as being suitable for the establishment of large-scale renewable energy facilities and the associated grid connection infrastructure. The establishment of the grid infrastructure associated with the proposed Bulskop PV SEF Cluster is therefore supported by the findings of the SIA.

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 B
(c) an indication of the scope of, and the purpose for which, the report was prepared;	Section 1.1, Section 1.2
(cA) an indication of the quality and age of base data used for the specialist report;	Section 1.2, Section 3,
(cB) a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;	Section 4
(d) the duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment;	Interviews in 2020 (Annexure A)
(e) a description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used;	Section 1.2, Annexure B
(f) details of an assessment of the specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of a site plan identifying site alternatives;	Section 4, Section 5,
(g) an identification of any areas to be avoided, including buffers;	Section 4
(h) a map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers;	Refer to Visual Impact Assessment (VIA)
(i) a description of any assumptions made and any uncertainties or gaps in knowledge;	Section 1.4,
(j) a description of the findings and potential implications of such findings on the impact of the proposed activity, including identified alternatives on the environment, or activities;	Section 4, Section 5
(k) any mitigation measures for inclusion in the EMPr;	Section 4
(l) any conditions for inclusion in the environmental authorisation;	Section 4, Section 5
(m) any monitoring requirements for inclusion in the EMPr or environmental authorisation;	N/A
(n) a reasoned opinion— i. as to whether the proposed activity, activities or portions thereof should be authorised; iA. Regarding the acceptability of the proposed activity or activities; and ii. if the opinion is that the proposed activity, activities or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr or Environmental Authorization, and where applicable, the closure plan;	Section 5.3
(o) a description of any consultation process that was undertaken during the course of preparing the specialist report	Annexure A, lists key stakeholders interviewed
(p) a summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	Annexure A, lists key stakeholders interviewed
(q) any other information requested by the competent authority	N/A
Where a government notice gazetted by the Minister provides for any protocol or minimum information requirement to be applied to a	Comply with the Assessment Protocols that were

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

ACRONYMS

BESS	Battery Energy Storage System
BWM	Beaufort West Municipality
CKDM	Central Karoo District Municipality
DEA&DP	Department of Environmental Affairs and Development Planning
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
IDP	Integrated Development Plan
IPP	Independent Power Producer
kV	Kilovolts
LED	Local Economic Development
LM	Local Municipality
Mtoe	Million tonnes of oil equivalent
MW	Megawatt
PGWC	Provincial Government Western Cape
REDZ	Renewable Energy Development Zone
REIPPPP	Renewable Energy Independent Power Producers Procurement Programme
SEF	Solar Energy Facility
SDF	Spatial Development Framework
SIA	Social Impact Assessment

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SECTION 1: INTRODUCTION

1.1 INTRODUCTION

Bulskop Grid (Pty) Ltd proposes the construction and operation of grid connection infrastructure for the proposed Bulskop PV SEF cluster consisting of six 120 MW facilities[2] located to the south of Beaufort West in the Western Cape Province. A grid connection corridor of approximately 300 m wide and 17.5 km long running an east-west direction from Bulskop collector substation/ switching station in the east to the Droerivier Main Transmission Substation (MTS) in the west is proposed (Figure 1.1).

This report contains the findings of the Social Impact Assessment (SIA) Report undertaken as part of the BA process for the proposed grid infrastructure.

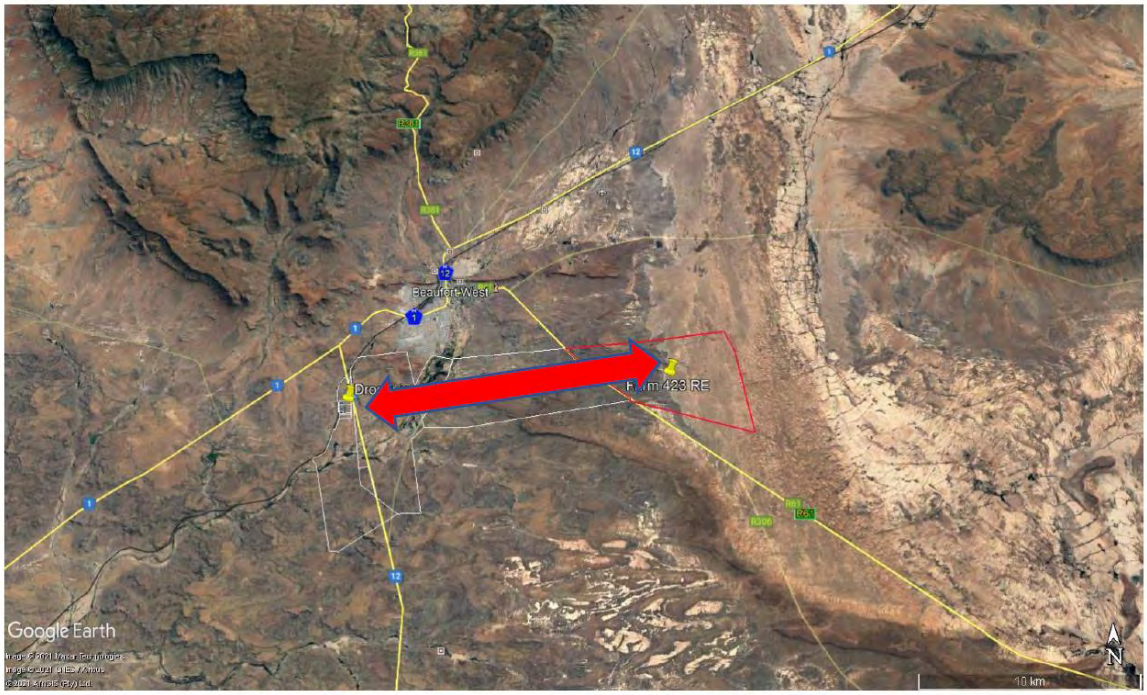


Figure 1.1: Location of alignment of Bulskop transmission line (red)

1.2 APPROACH TO STUDY

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

[2] Bulskop, Rosenia, Hoodia, Salsola, Gamka and Hardeveld PV SEFs.

- Describing and obtaining an understanding of the proposed intervention (type, scale, and location), and the community, land uses and activities that may be affected by the proposed project.
- Collecting baseline data on the current social and economic environment.
- Review of key policy planning documents that have a bearing on the project.
- Site visit and providing information on the project to key stakeholders.
- Identifying the key potential social issues associated with the proposed project.
- Assessing and documenting the significance of social impacts associated with the proposed project.
- Identification of enhancement and mitigation measures aimed at maximizing opportunities and avoiding and or reducing negative impacts.

1.3 PROJECT DESCRIPTION

Bulskop Grid (Pty) Ltd proposes the construction and operation of grid connection infrastructure for the proposed Bulskop PV SEF cluster of six 120 MW facilities[3] located to the south of Beaufort West in the Western Cape Province. A grid connection corridor of approximately 300 m wide and 17.5 km long is proposed. The grid corridor will connect the 6 PV projects to the Droerivier MTS. The grid connection infrastructure comprises the following:

- One Eskom collector substation/ switching station.
- One double circuit 132 kV overhead powerline from the Bulskop collector substation/ switching station to the Droerivier Main Transmission Substation (MTS). The height of the powerline will be ~ 32m.

Additional associated infrastructure will also be required for the grid connection solution, including access roads, feeder bays (inclusive of line bays, busbars, bussection and protection equipment), a fibre and optical ground wire (OPGW) layout, insulation, and assembly structures.

The grid connection crosses the following properties:

- Remaining Extent of Farm 423.
- Hans Rivier being Portion 5 of Farm No.169.
- Hans Rivier being Portion 4 of Farm No.169.
- Steenrotsfountain being Portion 1 of Farm No.168.
- Weltevreden being Portion 10 of Farm No. 170.

1.4 ASSUMPTIONS AND LIMITATIONS

1.4.1 Assumptions

Technical suitability

It is assumed that the development site represents a technically suitable site for the establishment of a solar energy facility and associated grid infrastructure. The site is also located within the Beaufort West Renewable Energy Development Zone (REDZ) and Central Transmission Corridor. The area has therefore been identified as being

[3] Bulskop, Rosenia, Hoodia, Salsola, Gamka and Hardeveld PV SEFs.

suitable for the establishment of renewable energy facilities and associated grid infrastructure.

Strategic importance of the project

The strategic importance of promoting solar energy and associated grid infrastructure is supported by the national and provincial energy policies. However, this does not mean that site related issues can be ignored or overlooked.

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. However, the study recognises the strategic importance of solar energy and the technical, spatial and land use constraints required for solar energy facilities.

The site is also located within the Beaufort West REDZ and Central Transmission Corridor. The area has therefore been identified as being suitable for the establishment of renewable energy facilities and the associated grid infrastructure.

1.4.2 Limitations

Demographic data

The information contained in some key policy and land use planning documents, such as Integrated Development Plans etc., may not contain data from Community Household Survey if 2016. However, this will not have a material impact on the findings of the study.

1.5 SPECIALIST DETAILS

Tony Barbour, the lead author of this report, is an independent specialist with 28 years' experience in the field of environmental management. In terms of SIA experience Tony Barbour has undertaken in the region of 260 SIAs and is the author of the Guidelines for Social Impact Assessments for EIA's adopted by the Department of Environmental Affairs and Development Planning (DEA&DP) in the Western Cape in 2007. Annexure C contains a copy of Tony Barbour's CV.

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

1.6 DECLARATION OF INDEPENDENCE

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

1.7 REPORT STRUCTURE

The report is divided into five sections, namely:

- Section 1: Introduction.
- Section 2: 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 CONTEXT

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[4]" 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. Furthermore, it also constitutes a key reporting requirement in terms of the applicable Western Cape Department of Environmental Affairs and Development Planning's *Guidelines for Social Impact Assessment* (2007).

The proposed grid connection infrastructure is linked to the FGPF. The review therefore includes reference to key policy documents that have a bearing on energy, specifically gas. At the local level the focus of the review has been on District and Local Municipal level policy and planning documents.

- National Development Plan (2011).
- New Growth Path Framework (2010).
- National Infrastructure Plan (2012).
- Integrated Energy Plan for South Africa (2016).
- Integrated Resource Plan (2018).
- Strategic Environmental Assessment (SEA) for wind and solar PV energy in South Africa (CSIR, 2015)
- The Western Cape Provincial Spatial Development Framework (2014 Revision).
- The Western Cape Infrastructure Framework (2013).
- Beaufort West Municipality Integrated Development Plan (IDP)(2019/2020).
- Beaufort West Spatial Development Framework (SDF)(2013).

2.2 NATIONAL DEVELOPMENT PLAN

The National Development Plan aims to eliminate poverty and reduce inequality by 2030. The NDP identifies a number of enabling milestones. Of relevance to the proposed development the NDP refers to the need to produce sufficient energy to support industry at competitive prices and ensure access for poor households, while reducing carbon emissions per unit of power by about one-third. In this regard the infrastructure is not just essential for faster economic growth and higher employment. It also promotes inclusive growth, providing citizens with the means to improve their own lives and boost their incomes. Infrastructure is essential to development.

[4] "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.

Chapter 3, Economy and Employment, identifies some of the structural challenges specific to South Africa, including an energy constraint that will act as a cap on growth and on options for industrialisation. The NDP notes that from an environmental perspective South Africa faces several related challenges. The reduction of greenhouse gas emissions and shift to a green, low-carbon economy, is one of these challenges.

In terms of implementation the NDP identifies three phases. The first two are of specific relevance to the proposed project. The first phase (2012−2017) notes that ensuring the supply of energy and water is reliable and sufficient for a growing economy. The second phase (2018−2023) involves building on the first phase to lay the foundations for more intensive improvements in productivity. The provision of affordable and reliable energy is a key requirement for this to take place.

Chapter 4, Economic infrastructure, notes that economic infrastructure provides the foundation for social and economic development. In this regard South Africa must invest in a strong network of economic infrastructure designed to support the country's medium- and long-term economic and social objectives. The plan envisages that, by 2030, South Africa will have an energy sector that promotes:

- Economic growth and development through adequate investment in energy infrastructure. The sector should provide reliable and efficient energy service at competitive rates, while supporting economic growth through job creation.
- Environmental sustainability through efforts to reduce pollution and mitigate the effects of climate change. More specifically, South Africa should have adequate supply security in electricity and in liquid fuels, such that economic activity, transport, and welfare are not disrupted.

The plan sets out steps that aim to ensure that, in 20 years, South Africa's energy system looks very different to the current situation. In this regard coal will contribute proportionately less to primary-energy needs, while gas and *renewable energy* resources, will play a much larger role.

2.3 NEW GROWTH PATH FRAMEWORK

Government released the New Economic Growth Path_Framework on 23 November 2010. The aim of the framework is to enhance growth, employment creation and equity. The policy's principal target is to create five million jobs over the next 10 years and reflects government's commitment to prioritising employment creation in all economic policies. The framework identifies strategies that will enable South Africa to grow in a more equitable and inclusive manner while attaining South Africa's developmental agenda. Central to the New Growth Path is a massive investment in infrastructure as a critical driver of jobs across the economy. In this regard the framework identifies investments in five key areas namely: *energy*, transport, communication, water, and housing.

2.4 NATIONAL INFRASTRUCTURE PLAN

The South African Government adopted a National Infrastructure Plan in 2012. The aim of the plan is to transform the economic landscape while simultaneously creating significant numbers of new jobs and strengthen the delivery of basic services. The plan also supports the integration of African economies. In terms of the plan Government will invest R827 billion over the next three years to build new and upgrade existing

infrastructure. The aim of the investments is to improve access by South Africans to healthcare facilities, schools, water, sanitation, housing and electrification. The plan also notes that investment in the construction of ports, roads, railway systems, *electricity plants*, hospitals, schools and dams will contribute to improved economic growth.

As part of the National Infrastructure Plan, Cabinet established the Presidential Infrastructure Coordinating Committee (PICC). The Committee identified and developed 18 Strategic Integrated Projects (SIPS). The SIPs cover social and economic infrastructure across all nine provinces (with an emphasis on lagging regions) and consist of:

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

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

SIP 8: Green energy in support of the South African economy
- Support sustainable green energy initiatives on a national scale through a diverse range of clean energy options as envisaged in the IRP 2010).

SIP 9: Electricity generation to support socio-economic development
- Accelerate the construction of new electricity generation capacity in accordance with the IRP 2010 to meet the needs of the economy and address historical imbalances.

SIP 10: Electricity transmission and distribution for all
- Expand the transmission and distribution network to address historical imbalances, provide access to electricity for all and support economic development.

2.5 INTEGRATED ENERGY PLAN

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

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

- Objective 1: Ensure security of supply.

- Objective 2: Minimise the cost of energy.
- Objective 3: Promote the creation of jobs and localisation.
- Objective 4: Minimise negative environmental impacts from the energy sector.
- Objective 5: Promote the conservation of water.
- Objective 6: Diversify supply sources and primary sources of energy.
- Objective 7: Promote energy efficiency in the economy.
- Objective 8: Increase access to modern energy.

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

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

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

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

The IEP notes that South Africa should continue to pursue a diversified energy mix which reduces reliance on a single or a few primary energy sources. In terms of existing electricity generation capacity, the IEP indicates that existing capacity starts to decline notably from 2025, with significant plant retirement occurring in 2031, 2041 and 2048. By 2050 only 20% of the current electricity generation capacity remains. As a result, large investments are required in the electricity sector in order to maintain an adequate supply in support of economic growth.

By 2020, various import options become available, and some new coal capacity is added along with new wind, *solar* and gas capacity. The mix of generation capacity technologies by 2050 is considerably more diverse than the current energy mix, across all scenarios. The main differentiating factors between the scenarios are the level of demand, constraints on emission limits and the carbon dioxide externality costs.

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

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

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

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

2.6 INTEGRATED RESOURCE PLAN

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

On 27 August 2018, the then Minister of Energy published a draft IRP which was issued for public comment (Draft IRP). Following a lengthy public participation and consultation process the Integrated Resource Plan 2019 (IRP 2019) was gazetted by the Minister of Mineral Resources and Energy on 18 October 2019, updating the energy forecast for South Africa from the current period to the year 2030. Of relevance to the proposed development provision has been made for 3000 MW from gas/diesel by 2030.

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

	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

The most dominant technology in the IRP 2019 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 1 600 MW for wind technology commencing in the year 2022 up to 2030. The solar PV allocation of 1 000 MWs per year is incremental over the period up to 2030, with no allocation in the years 2024 (being the year the Koeberg nuclear extension is expected to be commissioned) and the years 2026 and 2027 (presumably since 2 000 MW 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.

2.7 STRATEGIC ENVIRONMENTAL ASSESSMENT (SEA) FOR WIND AND SOLAR PV ENERGY IN SOUTH AFRICA

The Strategic Environmental Assessment (SEA) for wind and solar PV energy in South Africa (CSIR, 2015) identified eight (8) *Renewable Energy Development Zones* (REDZs) (Phase 1 REDZs). The REDZs identified areas where large scale wind energy facilities can be developed in a manner that limits significant negative impacts on the environment while yielding the highest possible socio-economic benefits to the country. On 17 February 2016, the Cabinet of the Republic of South Africa (Cabinet) approved the gazetting of Renewable Energy Development Zones (REDZs). 8 REDZs and 5 Power Corridors have been identified. On 26 February 2021, Minister Barbara Dallas Creecy, published Government Notice No. 142, 144 and 145 in Government Gazette No. 44191 which identified 3 additional REDZs (Phase 2 REDZs) for implementation as well as the procedures to be followed when applying for

environmental authorisation for electricity transmission or distribution infrastructure or large-scale wind and solar photovoltaic energy facilities in these REDZs. The total number of REDZ is therefore 11 (Figure 2.2). The proposed grid infrastructure is located within the Beaufort West REDZ and Central Transmission Corridor.

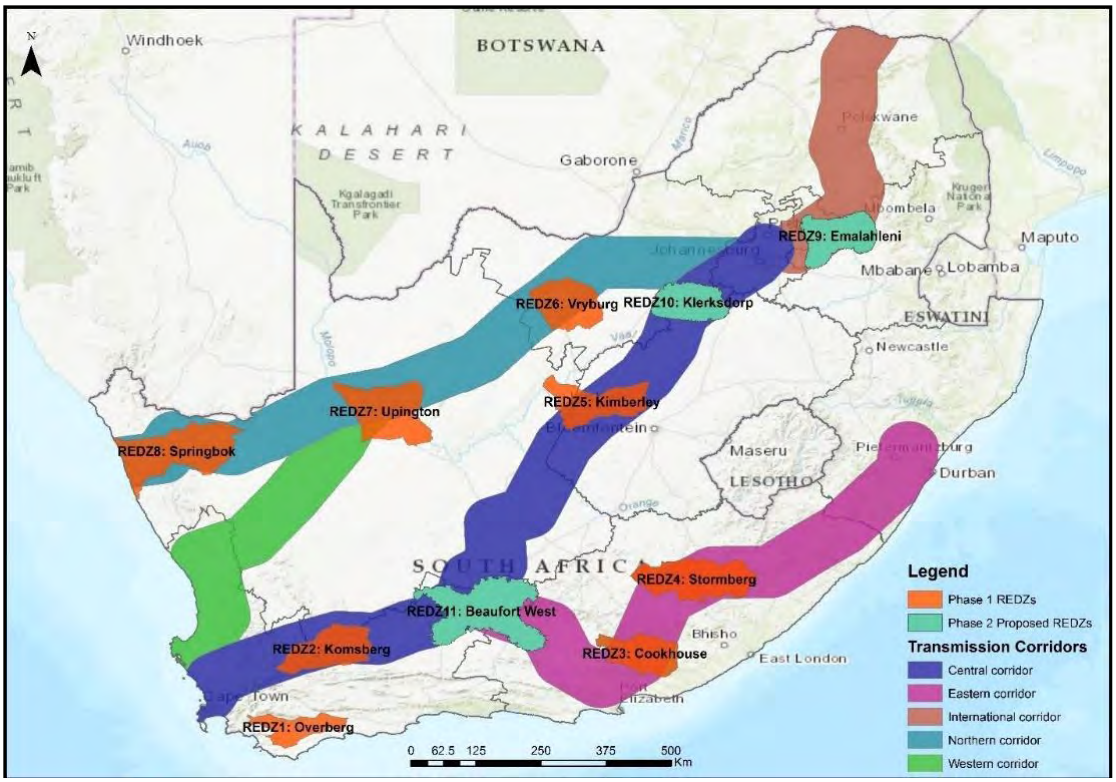


Figure 2.2: Location of Renewable Development Zones and Transmission Corridors in South Africa *(Source CSIR)*

2.8 WESTERN CAPE PROVINCIAL SPATIAL DEVELOPMENT FRAMEWORK

PSDFs are due for revision every five years. The 2014 Revision of the Western Cape PSDF replaces the 2009 PSDF. The 2014 PSDF was approved by MEC Bredell (Local Government, Environmental Affairs and Development Planning) in April 2014. In his Preface to the 2014 PSDF the MEC indicated that the 2014 PSDF carries the buy-in of all the Provincial departments to inform and guide their sector planning/spatial development strategies and is therefore 'owned' by all Heads of Department (PSDF, p.2).

While it builds on and continues to incorporate the key principles and spatial policies of the 2009 PSDF, the new PSDF replaces the 2009 one as policy framework. A number of reasons necessitated this replacement. These include the fact that the 2009 PSDF was drafted in a climate of economic buoyancy before the global recession had hit home. The 2009 PSDF also had to be updated in line with new policy such as the One Cape 2040 vision, LUPA, and the National Development Plan (NDP), as well as the results of the 2011 Census. Finally, the 2014 PSDF reflects PGWC's new transversal (cutting across departments) approach to government, while providing greater clarity about planning responsibilities of the three spheres of government.

The new PSDF is based on a set of 5 guiding principles, namely:

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

Under Sustainability and resilience, the PSDF notes that land development should be spatially compact, resource-frugal, compatible with cultural and scenic landscapes, and should not involve the conversion of high potential agricultural land or compromise ecosystems (p. 22). The 2004 Growth Potential Study was also revised in 2013 as part of the PSDF process[5].

Key spatial challenges are outlined in Chapter 2 of the PSDF. Energy security and climate change response are identified as key high-level future risk factors. The PSDF notes that the WCP is subject to global environmental risks such as climate change, depletion of material resources, anticipated changes to the global carbon regulatory environment, and food and water insecurity. The challenge would be to open up opportunities for inclusive economic growth, and decouple economic growth from resource consumptive activities (i.e. the development of a 'greener' economy, as outlined in the 2013 WCP Green is Smart strategy – see further below).

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

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

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

[5] eadp-westerncape.kznsshf.gov.za/sites/default/files/news/files/2013-10-15/2013-growth-potential-study-of-towns-report_0.pdf. The 2014 PSDF is informed by three additional studies, also available at the above link.

Chapter 3.1 deals with the sustainable use of the WCP's assets. These are identified as Biodiversity and Ecosystem services; Water resources; Soils and Mineral resources; Resource consumption and disposal; and Landscape and scenic assets. Policies are outlined for each of these themed assets. The last two themed assets are of specific relevance with regard to renewable energy.

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

Energy
With regard to energy use, the PSDF notes that the Cape Metro (albeit the province's most efficient user) and West Coast regions are the WCP's main energy users. It further notes that the WCP's electricity is primarily drawn from the national grid, which is dominated by coal-based power stations, and that the WCP currently has a small emergent renewable energy sector in the form of wind and solar generation facilities located in its more rural, sparsely populated areas. The PSDF also reiterates PGWC's commitment to shifting the economy towards gas[6] as transitional fuel (see WCIP below). Most of the energy discussion in the PSDF is dominated by aspects pertaining to natural gas.

With regard to renewable energy, the following policy provisions are of relevance:

- Policy R.4.6: *Pursue energy diversification and energy efficiency in order for the Western Cape to transition to a low carbon, sustainable energy future, and delink economic growth from energy use*.
- R.4.7: *Support emergent Independent Power Producers (IPPs) and sustainable energy producers (wind, solar, biomass and waste conversion initiatives) in suitable rural locations (as per recommendations of the Strategic Environmental Assessments for wind energy (DEA&DP) and renewable energy (DEA)*[7].

Unlike the 2009 PSDF, the new PSDF does not provide any spatial provisions with regard to REF or transmission line infrastructure. Instead, such determination is envisaged in terms of the WCP WEF SEA, the DEA REF SEA, municipal SDFs, etc.

In this regard the two policy directives contained in the 2009 PSDF that had a direct relevance for SEFs are not contained in the 2014 revision, namely:

- *HR26 (…) transmission lines (…) should be aligned along existing and proposed transport corridors rather than along point to point cross-country routes.* (Mandatory directive).
- *HR27 Wind farms should be located where they will cause least visual impact, taking into consideration the viability of the project.* (Guiding directive)[8]

[6] The PSDF at present envisages mainly from offshore West Coast gas fields via a terminal at Saldanha. The PSDF refers to the potential exploitation of own shale reserves, but also to the environmental sensitivity involved.
[7] See notes under Regional Methodology Review below.
[8] Assume also applies to solar energy facilities

Climate change

Water scarcity is identified as probably the key risk associated with climate change. Essentially the same primary response objectives outlined in the 2014 Western Cape Climate Change Response Strategy (WCCCRS – see 4. below) are identified in the PSDF. These are energy efficiency, demand management and renewable energy.

Policy provisions are made with regard to climate change adaptation and mitigation. Concerning renewable energy, the following is of relevance:

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

Landscape and scenic assets

A specialist study was undertaken into the Province's cultural and scenic landscapes. This study[9] was one of the informants of the 2014 PSDF. It established that the WCP's cultural and scenic landscapes are significant assets underpinning the tourism economy, but that these resources are being incrementally eroded and fragmented. According to the study agriculture is being reduced to 'islands', visual cluttering of the landscape by non-agricultural development is prevalent, and rural authenticity, character and scenic value are being eroded. The mountain ranges belonging to the Cape Fold Belt together with the coastline are identified as the most significant in scenic terms and underpin the WCP's tourism economy.

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

- R.5.6: *Priority focus areas proposed for conservation or protection include -*
  - *Rural landscapes of scenic and cultural significance situated on major urban edges and under increasing development pressure, e.g. Cape Winelands.*
  - *Undeveloped coastal landscapes under major development pressure.*
  - *Landscapes under pressure for large scale infrastructural developments such as wind farms, solar energy facilities, transmission lines and fracking, e.g. Central Karoo.*
  - *Vulnerable historic mountain passes and 'poorts'*.

Chapter 3.2 deals with opportunities in the WCP spatial economy, including with regard to regional infrastructure development. Essentially the same objectives are identified as in the WCIF, including the promotion of a renewable energy sector (p.61). General project-based (EIA and specialist assessment) provisions are made for evaluating the suitability of sites proposed for bulk infrastructure (Policy E.1).

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

2.9 WESTERN CAPE INFRASTRUCTURE FRAMEWORK

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 2009-2014 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.

2.10 BEAUFORT WEST MUNICIPALITY INTEGRATED DEVELOPMENT PLAN

The vision for the BWM as set out in the IDP (2017-2022) is "Beaufort West, economic gateway in the central Karoo, where people are developed and live-in harmony together". The mission is "to reflect the will of the South African people as reflected in the Constitution and by Parliament. In so doing the municipality aims to:

- To provide excellent services to the residents of Beaufort West Municipality.
- To reduce poverty and promote the empowerment of women, youth and people living with disabilities.
- To create a crime-free, safe, and healthy environment.

The IDP lists the five Key Performance Areas, namely:

- Basic Service Delivery and Infrastructure Development (KPA 1).
- Local Economic Development (KPA2).
- Institutional Development and Municipal Transformation (KPA 3).

- Financial Viability and Management (KPA 4).
- Good Governance and Public Participation (KPA 5).

KPA 1 (Basic Service Delivery and Infrastructure Development) and KPA 2 (Local Economic Development (KPA2) are relevant to the proposed project. However, the IDP notes that the municipality does not have an LED Strategy and Implementation Plan in place.

The key challenges facing the BWM include:
- Electricity capacity constraints
- Poor maintenance of existing public facilities
- High rate of the unemployment and low household income levels.
- (Identification and implementation of more labour intensive catalytic projects)
- Sustainable Economic Growth (Speed up economic growth and transform the economy to create decent work and sustainable livelihoods, Strategy for economic growth and inclusion)

The IDP notes that the key objectives associated with KPA 2 include facilitating investment and maintenance of economic and social infrastructure to ensure infrastructure-led economic growth and development. Linked to this is the creation of an investment friendly environment to attract investment to enable growth and job creation. The proposed development has the ability to create employment and attract investment to the area.

The strategies identified to address the challenges facing the municipality include:

- Facilitate development and growth of SMME's.
- Facilitate Education and Skills Development for Cooperatives & SMME's.
- To provide SMME Support and Capacity building.

The establishment of the proposed PV SEF can assist to support these strategies. The 2017-2022 IDP was informed by a SWOT Analysis which identified a number of challenges facing the municipality of which the following are relevant to the proposed development:

- Access to technology and technological advances.
- Unable to attract skilled staff to the area.
- No formal policy on green energy.
- Rural area with low development opportunities.
- Water scarcity and high electricity costs.
- Revenue and cash constraints with high number of indigents.

The proposed development will not solve all of these challenges. However, the development can contribute towards addressing some of the challenges.

The IDP highlights the risks posed by climate change, noting that the risk is relatively high in Beaufort west Municipality as it is an arid area that has always been prone to drought situations. The sectors that are vulnerable to climate change include agriculture and tourism. In terms of renewable energy, the 2017-2022 IDP notes that innovative solutions can contribute towards growth and development of the municipality, including the introduction of solar energy. The IDP also identifies major infrastructure projects that can be implemented to develop and promote economic

development in the area, including large wind and *solar* energy projects subject to appropriate guidelines and siting principles.

A number of community meetings were held as part of the review of the 2017-2022 IDP. The key issues identified in Ward 2 where the proposed project is located included:

- Housing project for Nelspoort, paving of roads, renovation of hall and sport fields.
- Upgrade of water supply infrastructure.
- Upgrading/fencing and provision of toilet and water at cemetery.
- Establishment of a service cecentre for pensioners.
- Upgrading of the stadium.
- Cleaning of river.
- Provision of school transport for children.

Some of these issues can inform the identification of SED allocations during the operational phase.

2.11 BEAUFORT WEST MUNICIPALITY SPATIAL DEVELOPMENT FRAMEWORK

The spatial vision for the municipality set out in the 2013 Spatial Development Framework is "Wilderness tourism and transport gateway to the people, mountains and plains of the Central Karoo". The SDF notes that the implications of this vision are that the main rural economic resource outside of eco-tourism is extensive agriculture.

The growth of this resource depends on improving the carrying capacity of the land through good veld management practices. The SDF does not comment on the potential impact of renewable energy projects on the natural environment. However, it does refer to shale gas exploration and uranium mining and the need to ensure that key areas such as CBAs, conservancies and stewardship areas and visually sensitive landscapes contributing to long term heritage and tourism opportunities should be avoided. The same principles are also likely to apply to the establishment of large renewable infrastructure developments. However, as indicated above, the site is located within the Beaufort West REDZ. The SDF was prepared in 2013 and therefore pre-dates the establishment of the REDZs in 2018.

In terms of economic function, the SDF notes that Beaufort West the most important settlement in the municipality and also plays a sub-regional role serving other small towns beyond its boundaries, particularly to the west, e.g. Victoria West, Fraserburg, and Loxton. It is also a major refuelling and service stop on the N1 highway for trucks and is an important station on the national rail route between Cape Town and Gauteng.

The SDF lists five main structuring elements, namely:

- The N1 road and adjacent rail route which is the main transport and socioeconomic artery through the municipality.
- The Nuweveld mountains to the north form an impressive scenic backdrop to the municipality. This area contains large areas of significant CBAs and most of the formal and informal conservation areas in the BWM.
- The Gamka River basin which contains the settlements of Beaufort West and Merweville. This area is used for extensive small stock farming.
- The Sout River Basin to the south-east of Beaufort West which is a large area of significantly degraded land with extremely low stock carrying capacity and low

concentrations of people. The proposed project is located in the South River Basin area.

- The area to the west of Murraysburg which forms an almost separate eco and social system. It is the highest, wettest, and most fertile part of the municipality where most of the small areas of intensive farming are found, particularly in the west. In the south the landscape rises up to the Sneeuberg. It is 91kms from Graaff Reinet in the Eastern Cape and 158kms from Beaufort West. This remote location creates a significant challenge as it depends on services delivered from Beaufort West.

Figure 2.3 provides an overview of the proposed SDF concept for the BWM.

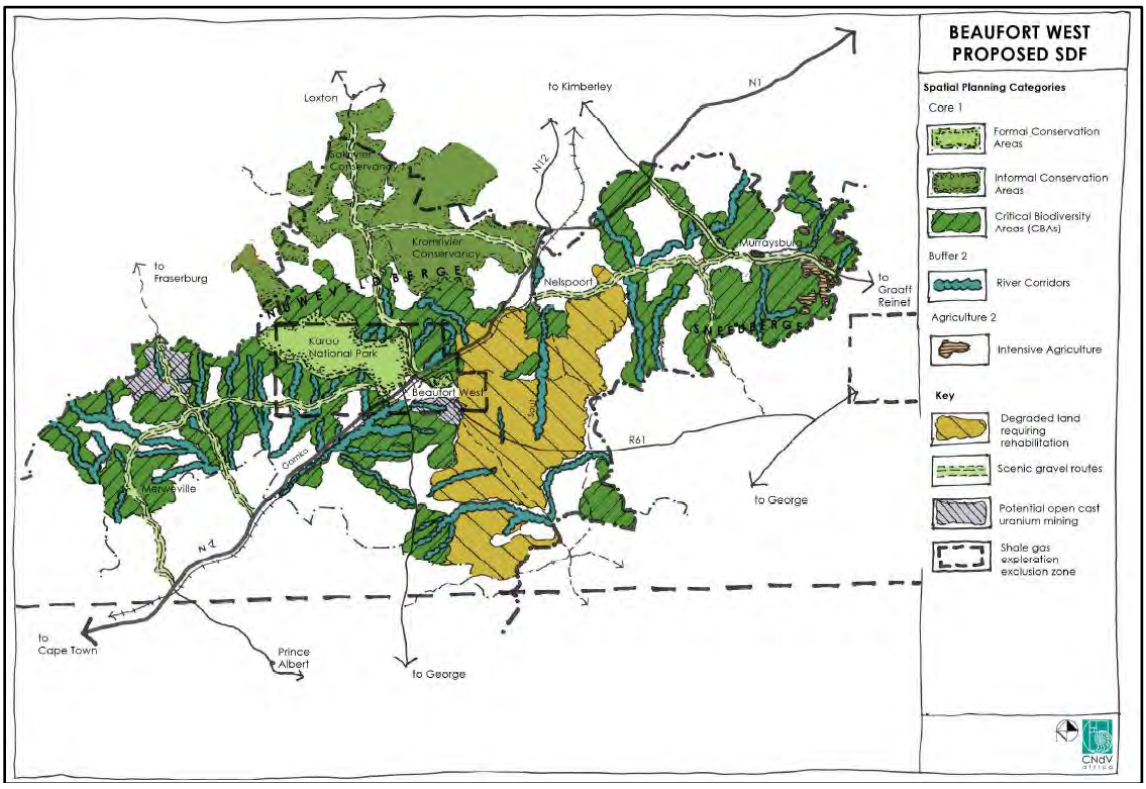


Figure 2.3: Beaufort West Municipality: Broad SDF Concept

Section 5.2.1 of the SDF lists four bio-regions that can be distinguished in terms of the natural environment and economy. Figure 2.4 illustrates the location of the bio-regions within the BWM. Table 2.1 lists the characteristics of each region, including renewable energy potential.

The bio- regions are:

- Nuweveld Highlands.
- Gamka River Basin.
- Sout River Badlands.
- Sneeuwberg Foothills.

The PV cluster is located in the Sout River Badlands, which corresponds to the Sout River Basin area (see above).

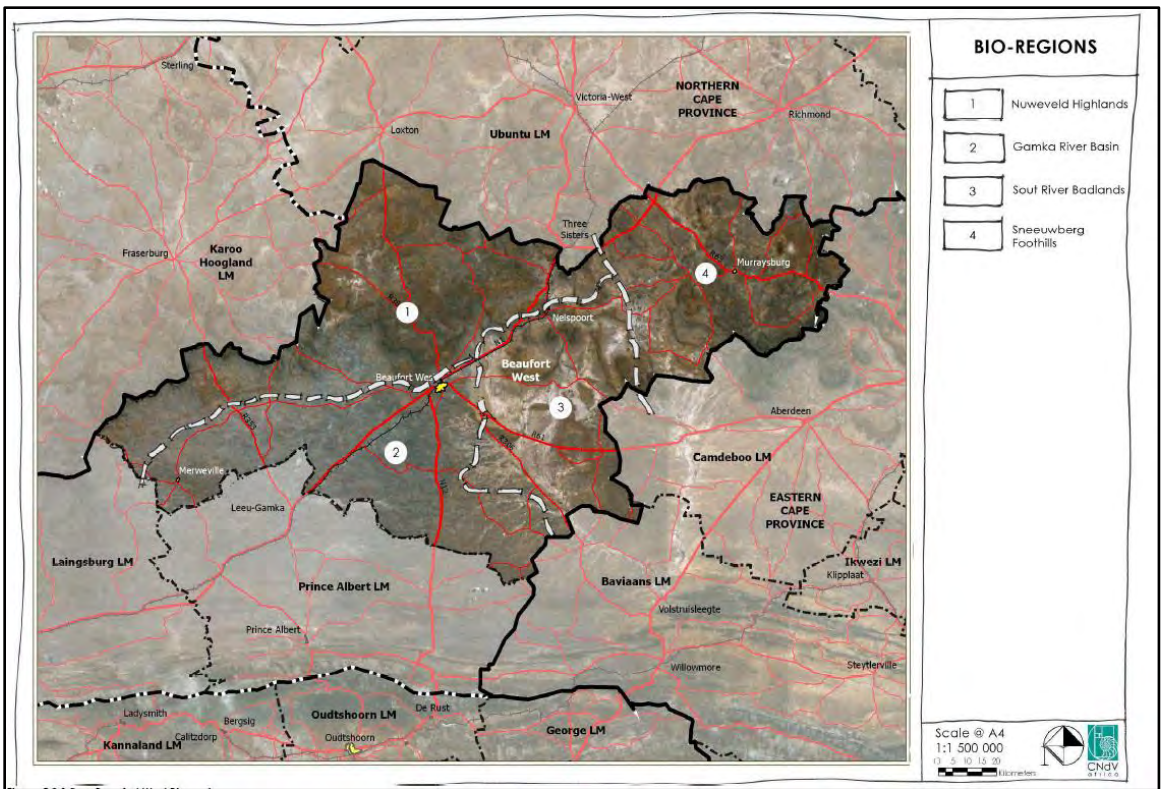


Figure 2.4: Beaufort West bio-regions

Table 2.1: Characteristics of bio-regions

	Nuweveld Highlands	Gamka River Basin	Sout River Badlands	Sneeuwberg Foothills
Altitude (m)	1250-1750	750 - 1250	750 – 1250	1250 - 2000
Population distribution	Very few rural - few – isolated farmsteads and conservation areas	Beaufort W. 40 500 Merweville 1200	Nelspoort 1300	Murraysburg 4500 Rural areas – ± 1 000
Agriculture	Stock farming	Stock farming – better quality veld	Stock farming – low carrying capacity	Mainly extensive, some dryland crops– 5 000 ha Irrigation 1000 ha
Mining	Potential open cast uranium mine on R353 Shale gas exploration except Karoo National Park	Potential open cast uranium mine on R61 Shale gas exploration	Shale gas exploration	Shale gas exploration
Bio-diversity	Extensive CBAs Nama Karoo	Some CBAs Nama Karoo	Excessive degradation Nama Karoo and Dry Karoo Grassland	Extensive CBAs Nama Karoo
Tertiary	Eco and agri-tourism - hunting	Eco and agri – tourism – hunting, Transport, wholesale, retail and services – Beaufort West town	Possibly some eco-tourism - hunting	Eco and agri-tourism - hunting
Renewable energy potential	Fairly good solar Fairly good wind	Fairly good solar Fairly good wind	Fairly good solar Fairly good wind	Fairly good solar Fairly good wind
Hydrology	Source of numerous non-perennial in relatively undisturbed state	Gamka river basin with rivers in relatively undisturbed to disturbed state	Sout River in extremely disturbed state needing significant rehabilitation including many other non-perennial rivers in bio-region	Numerous perennial and non-perennial rivers in good condition
Landscape character	Classical steep mountain ranges forming impressive backdrop to whole municipality westwards from N1	Flat cosmic plains flowing to the south framed by Nuweberg to the north	Flat desert-like cosmic plain inclining to the south	Romantic landscape of rolling hills rising to the Sneeuwberg in south

As indicated in Table 3.1, the Sout River bio-region has "fairly good solar and wind" potential. The carrying capacity of the area is low, and the landscape is described as "flat, desert like cosmic plain inkling to the south". The largest town in the region is Nelspoort, which used to be located on the N1 when it followed the railway line, but this section has now been bypassed. This has left the village isolated.

Section 5.2.1, Natural Systems Synthesis, notes that the Annual Horizontal Solar Radiation is fairly high – 2000 – 2100 KWh/m2, increasing towards the north. Similarly, wind speeds of 6 – 8m/s are also fairly high. The section notes that both these sources could be potential energy generators.

Section 5.4.1.6, Wind and Solar Farm Siting Principles, lists a set of siting principles that are proposed to be used as a first set of questions to guide potential developers of wind and solar farms. The focus is largely on wind farms. However, the following are also relevant to solar farms:

- Slopes by gradient classes.
- Rocky areas.
- Soil type and permeability.
- Natural watercourses and areas with high water table, Rainfall data.
- Vegetation types and sensitivity.
- Road layout and design – slopes to be considered in road layout to reduce erosion potential of road run-off, rock-fall and landslide potential.
- Re-vegetation – steep road verges and cuts require re-vegetation to reduce sedimentation from run-off.
- Soil types and potential for erosion.
- Soil types influence on road construction and re-vegetation.
- Surface Hydrology and Groundwater. Design of roads and treatment of runoff from roads and disturbed surfaces to reduce sedimentation and eliminate erosion.

As indicated above, the proposed project is located within the Sout River bio-region The carrying capacity of the area is low, and the landscape is described as "flat, desert like cosmic plain inkling to the south". The area appears to be well suited for the establishment of PV SEFs and associated grid infrastructure.

SECTION 3: OVERVIEW OF THE STUDY AREA

3.1 INTRODUCTION

Section 3 provides an overview of the:

- The administrative context.
- The socio-economic context.
- The demographic context.
- The site and surrounding land uses.

3.2 ADMINISTRATIVE CONTEXT

The proposed Bulskop PV SEF Cluster and associated grid infrastructure is located within the Beaufort West Municipality (BWM), which is one of three local municipalities that make up the Central Karoo District Municipality (CKDM), within the Western Cape Province (Figure 3.1). The main towns and settlements include Beaufort West, Murraysburg and Merweville. Beaufort West serves as the administrative centre of the BWM and CKDM. The proposed PV SEF Cluster and associated grid infrastructure site largely is located in Ward 2.

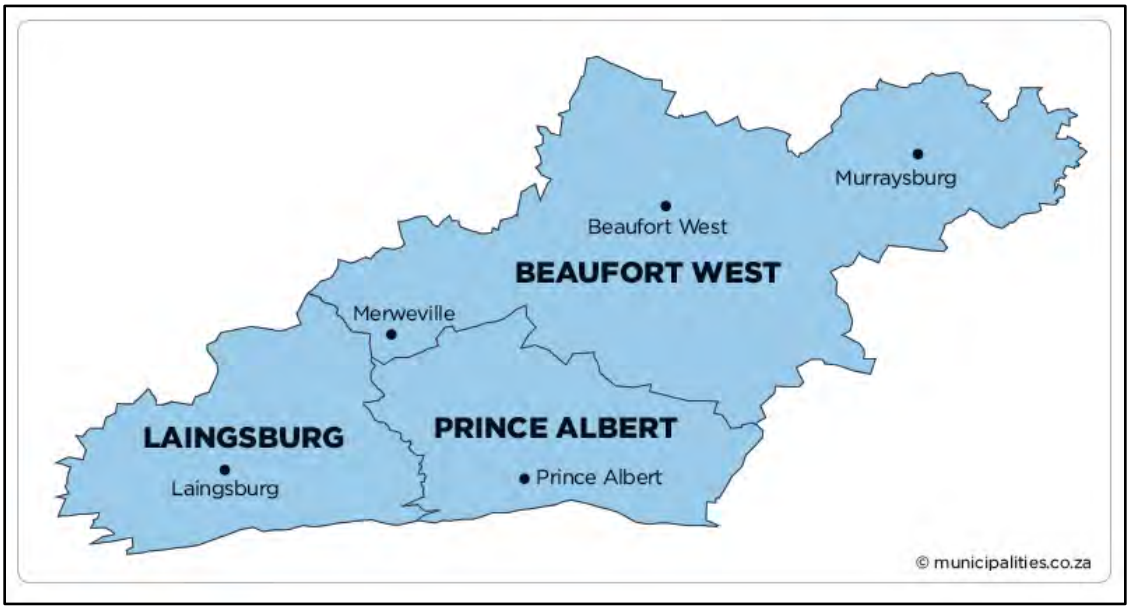


Figure 3.1: Beaufort West Municipality within Central Karoo District Municipality

3.3 DEMOGRAPHIC OVERVIEW BEAUFORT WEST MUNICIPALITY

Population

The population of the BWM in 2016 was 51 080. Of this total, 36.4% were under the age of 18, 56.7% were between 18 and 64, and the remaining 7% were 65 and older. The population of Ward 2 in 2011 was 6 975. Ward 2 is therefore a large, sparsely populated area with no large settlements. Of this total, 28.2% were under the age of 18, 64.9% were between 18 and 64, and the remaining 6.9% were 65 and older. The BWM has a relatively high percentage of people under the age of 18 and over the age of 65. This implies that a larger percentage of the population is dependent on the economically productive sector.

The dependency ratios for the BWM and Ward 2 were 76.5[10] (2016) and 54% (2011) respectively. The national dependency ratio in 2011 was 52.7%, while the Western Cape Province had the lowest provincial dependency level in South Africa, namely 45% in 2011. The municipal level is therefore significantly higher than the national and provincial level.

The dependency ratio is the ratio of non-economically active dependents (usually people younger than 15 or older than 64) to the working age population group (15-64). The higher the dependency ratio the larger the percentage of the population dependent on the economically active age group. This in turn translates reduced revenue for local authorities to meet the growing demand for services[11].

In terms of race groups, Coloureds made up 75.1% of the population on the BWM (2016), followed by Black Africans (17.7%) and Whites, 7%. In Ward 2 (2011), Coloureds made up 60.8%, followed by Whites (27%) and Black Africans (10.8%). The main first language spoken in the BWM and Ward 2 was Afrikaans (83% and 82.9% respectively), followed by isXhosa (13.1%) in the BWM and English (2.9%) in Ward 2.

Households and house types

There are a total number of 14 945 (2016) and 2 020 (2011) households in the BWM and Ward 2 respectively. Of these 99% (BWM) and 81.4% (Ward 2) were formal houses. Only 0.3% of structures in the BWM were shacks. The majority of dwellings in the BWM and Ward 2 are therefore formal structures. Approximately 39.8% of the households in the BWM and 24.2% of the households in Ward 2 were headed by women. The figures are lower than the district level, namely 40.8%, and similar to the provincial level (38%). Despite being lower than the district averages, women headed

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

[11] A high dependency ratio can cause serious problems for a country if a large proportion of a government's expenditure is on health, social security & education, which are most used by the youngest and the oldest in a population. The fewer people of working age, the fewer the people who can support schools, retirement pensions, disability pensions and other assistances to the youngest and oldest members of a population, often considered the most vulnerable members of society.

households tend to be more vulnerable and reflect a lack of employment opportunities in the area, which result in the men leaving to seek work in larger, urban areas.

Household income

Based on the data from the 2011 Census, 9.9% of the population of the BWM had no formal income, 3.3% earned less than R 4 800, 5.8% earned between R 5 000 and R 10 000 per annum, 21.6% between R 10 000 and R 20 000 per annum and 23.7% between R 20 000 and 40 000 per annum (2016). For Ward 2, 8.2% of the population had no formal income, 1.9% earned less than R 4 800, 3.1% earned between R 5 000 and R 10 000 per annum, 16.3% between R 10 000 and 20 000 per annum and 19.4% between R 20 000 and 40 000 per annum (Census 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 64.3% of the households in the BWM and 48.9% in Ward 2 live close to or below the poverty line. The current figures for both the BWM and Ward 2 are likely be higher due to impact of COVID-19 pandemic on the national, provincial, and local economy.

The low-income levels reflect the reliance on season employment in the agricultural sector and limited formal employment opportunities in the BWM. 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 BWM. This in turn impacts on the ability of the BWM to maintain and provide services.

Employment

The official unemployment rate in the BWM in 2016 was 12.2%, while 44.1% were regarded as not economically active and 8.3% were discouraged work seekers. The figures for Ward 2 in 2011 were 6.2% and 37.1% respectively. These figures are significantly lower than the official unemployment 2011 rates for the Western Cape Province (21.6%) and National (29.8%). These lower rates do not however reflect seasonal unemployment which represents a significant challenge in the agricultural sector in the area.

The 2020 Socio-economic profile of the BWM prepared by the Provincial Government notes that the BWM (24.2%) had the highest unemployment area in the CKDM (22%) in 2019. The rate was also higher than the provincial rate (19.4%). The report notes that the high unemployment rate is particularly concerning given that this estimate is based on the narrow definition of unemployment i.e. the percentage of people that are able to work, but unable to find employment. In turn, the broad definition generally refers to people that are able to work, but not actively seeking employment. The current unemployment rates are likely be higher due to impact of COVID-19 pandemic on the national, provincial, and local economy.

Education
In terms of education levels, the percentage of the population over 20 years of age in the BWM and Ward 2 with no schooling was 5.5% (2016) and 6.8% (2011) respectively, compared to 2.4% for the Western Cape (2016). The percentage of the population over the age of 20 with matric was 32.3% and 28.3% respectively, compared to 35.2% for the Western Cape. The education levels in the BWM and Ward 2 are therefore marginally lower than the provincial levels. This reflects the rural nature of the area and the highlights the vulnerability of the local communities in these areas.

3.4 MUNICIPAL SERVICE LEVELS BEAUFORT WEST MUNICIPALITY

Access to water
Based on the 2016 Household Community Survey, 78.4% of households in the BWM have piped water inside their houses, while 17.7% relied on piped water in their yards. Based on the 2011 Census, 58.1% of households in Ward 2 were provided water by a service provider and 36.6% relied on boreholes. The figures for Ward 2 reflect the rural nature of the area. In addition, due to the rural, dispersed nature of the area, it is both difficult and costly to provide municipal services, hence the reliance on boreholes.

Sanitation
98% of the households in the BWM had flush toilets, while only 0.3% had no access to sanitation facilities. In Ward 2, 82.4% of households had flush toilets and 7.5% had no access to sanitation facilities.

Refuse collection
94.9% of the households in the BWM had their waste collected by a service provider on a regular basis, while 3% relied on their own dump. In Ward 2, 61% had their waste collected by a service provider on a regular basis and 30.3% relied on their own dump. The figures for Ward 2 reflect the rural nature of the area. In addition, due to the rural, dispersed nature of the area, it is both difficult and costly to provide municipal services, hence the reliance on their own dump.

3.5 SOCIO-ECONOMIC OVERVIEW BEAUFORT WEST MUNICIPALITY[12]

In 2018 the economy of the Beaufort West municipal area was valued at R2.2 billion (current prices) and employed 12 515 people. Historical trends between 2014 and 2018 indicate that the municipal area realised an average annual growth rate of 0.6%. While growth within the primary sector remained relatively stagnant between 2014 and 2018 (0.1%), the secondary and tertiary sectors grew at 0.4 and 0.8 % respectively. The economy is overall expected to contract by 1.1% in 2019. Like the rest of South Africa, economic growth in 2020 and 2021 will be negatively impacted by COVID 19. This is expected to affect each of the key economic sectors.

In terms of sectoral contributions, general government (R475.5million), transport, storage, and communication (R369.8million) and the wholesale and retail trade,

[12] Based on 2020 Socio-economic Profile: Beaufort West Municipality, prepared by the Western Cape Government

catering, and accommodation (R329.3million) sectors were the main contributors to growth in the municipal area.

The latter two sectors are however both expected to contract in 2019 (0.6 and 0.1 % respectively). Although the agriculture, forestry and fishing sector contributed a significant number of additional jobs in the CKD between 2014 and 2018 (47 jobs), it is estimated that this sector suffered the largest GDPR contraction (8.7 percent) in 2019. The contribution in terms of generating new employment opportunities will therefore be limited

3.6 PROJECT LOCATION AND SURROUNDING LAND USES

3.6.1 Introduction

The proposed Bulskop Collector Switching Station (CSS) and overhead 132 kV line are located ~11.5 km to the south-east and ~2.4 km south of the built edge of Beaufort West in the Central Karoo region of the Western Cape Province (WCP) respectively (Figure 3.2). Beaufort West is the largest town in the area and serves as the administrative seat of both the BWM and Central Karoo District Municipality (CKDM).

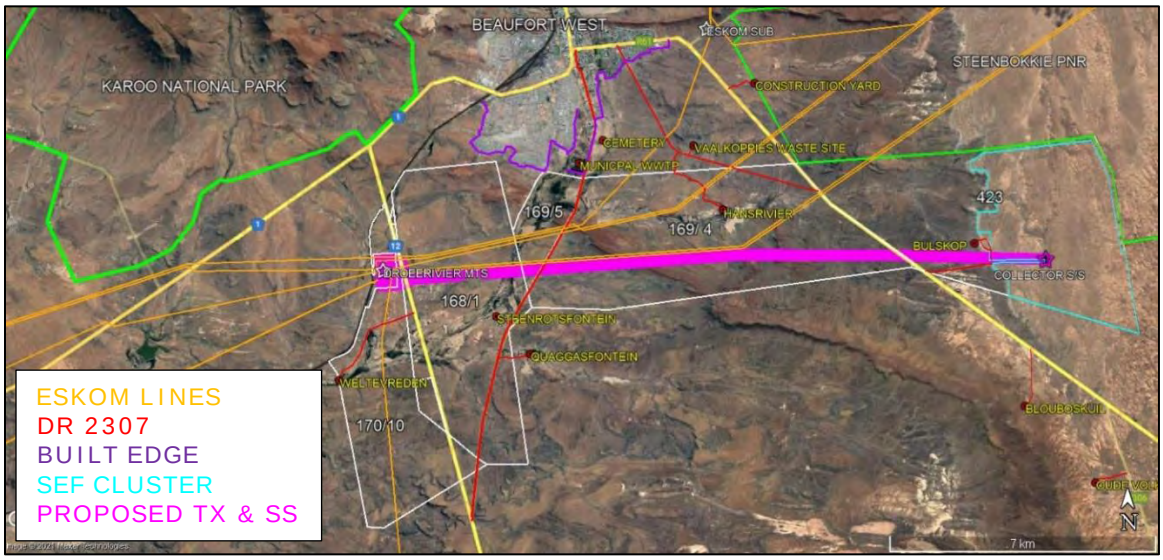


Figure 3.2: Proposed grid connection (300 m corridor) and Eskom switching station indicated in relation to Beaufort West and existing infrastructure and formal conservation areas

Beaufort West is located to the south of the Great Escarpment (Nuweveldberge Range), in the northern portion of the arid plain traditionally referred to as the Koup. The Koup also encompasses the towns of Laingsburg, Leeu-Gamka and Prince Albert, i.e., much of the CKDM area. The Koup is arid, and prone to extended periods of drought. The study area is currently experiencing its 7th consecutive year of drought (Photograph 3.1).

Photograph 3.1: Drought-stricken veld on the northern portion of the Steenbokkie PNR, looking south-east (towards Bulskop farm) from the **property's northern boundary**

Beaufort West was proclaimed 1818 and is located near the headwaters of the Gamka River (a tributary of the Gourits River). The confluences of a number of Gamka tributaries – viz. the Kuils-, Hans- and Droeë Rivers – are located to the south of the town. While flow is seasonal, snowmelt from the Nuweveldberge and a number of fountains historically provided year-round water to the town and some adjacent farms. The town currently draws its water supply from a number of dams and boreholes associated with the Gamka system. These are located on municipal and privately-owned farms. The relative importance of groundwater sources has increased significantly during the current drought.

The Koup vegetation consists of low-growing karroid scrub, in some places complimented by grasses. Trees and large shrubs are restricted to ephemeral drainage lines and water courses. The natural grazing pattern historically favoured rainfall-induced migratory use (by plains game) over sedentary use. The region is historically a stock farming area. Sheep farming is still the dominant activity, supplemented by (angora) goats and, to a lesser extent, cattle. Game occurs on a number of farms, but the study area is not a major game farming area. This is linked to low veld carrying capacities and limited habitat diversity, lack of cover and perennial water sources.

The carrying capacity of the veld in the study area is in the region of 5-6 ha per sheep or goat. Despite appearance, the so-called 'Hardeveld' vegetation (and grazing resource) is not uniform. This is largely linked to differences in soil type, something more apparent from satellite imagery than on the ground. Farming properties are consequently typically extensive, ideally containing some veld diversity. A number of operations consist of several properties. Pre-drought, 3 000 ha was generally considered a minimum viable operation size. Properties are typically stocked year-round, with stock moved between internal camps on a rotational basis for the purposes of optimal grazing and veld conservation. During the current drought, farmers have been forced to buy in fodder to keep their animals alive (Photograph 3.2). Many farmers in the Beaufort West area have been severely impacted by the drought.

Photograph 3.2: Sheep on Bulskop farm provided with supplementary feed

The region is too arid – and the soils generally too shallow - to support significant dryland or irrigated cropping activities. Historic and existing cropping activities are essentially limited to relatively small areas associated with the floodplains of ephemeral rivers. On the farms located immediately to the south of Beaufort West, cropping activities historically consisted of small plantings of fodder crops and to a lesser extent, vegetables. The drought has severely impacted on these cropping activities.

The rural settlement pattern is sparse, with farmsteads concentrated along public roads and river courses (near town). Most of the farms are inhabited, either by an owner, caretaker, or lessee. Limited permanent employment opportunities are associated with the farming operations. Some farm workers live on the farms where they work, while others live in town, and are transported to and from work on a daily or weekly basis.

Apart from stock farming, Beaufort West's economy is underpinned by its strategic location on the N1. Located more or less midway between Cape Town and Bloemfontein, Beaufort-West is a well-known sleep-over location for travellers on the route. The town offers a number of refuelling and repair facilities to trucks and passenger vehicles. A number of logistics operations are also based in town. Smaller shops – e.g., convenience stores and fast-food outlets – benefit from the passing trade.

The tourist accommodation sector is largely based on passing (as opposed to dedicated) visitor flows associated with the N1 route. Many guest farms around Beaufort West also offer seasonal hunting opportunities on a limited scale. Dedicated tourism is mainly associated with the Karoo National Park (NP) located to the north-west of Beaufort West. The area to the south of the park is impacted by the N1 and five large transmission lines which are located ~ 3km south of the park boundary. The Steenbokkie Private Nature Reserve (PNR) is located ~2 km to the east of town. Steenbokkie offers a range of self-catering accommodation facilities (caravan site, cottages, on-suite rooms) to passing travellers, as well as seasonal hunters. Accommodation facilities and activities are concentrated along the Hopewell grave road in the northern portion of the ~7 500 ha property, i.e., away from the proposed 132 kV line and CSS (Photograph 3.3).

Photograph 3.3: Chalets on Steenbokkie PNR to the south of the Hopewell gravel road

Other key roads in the study area include the N12 ('Oudshoorn Road') and the R61 ('Aberdeen Road'). The N12, which links up with Oudshoorn and George, intersects with the N1 ~2.7 km west of Beaufort West (Photograph 3.4). The R61 intersects with the N1 in Beaufort West (as Voortrekker Street) (Photograph 3.5) and provides a link to Aberdeen and Graaff-Reinet located to the east in the Eastern Cape Province. The R61 is a key taxi route between the Western and Eastern Cape Provinces and Beaufort West is an important stop on the route. Traffic volumes peak over holiday periods, especially Easter weekend and Christmas season. The R61 is currently being resurfaced. The road portion east of Beaufort West (beyond the project area) has already been completed.

Photograph 3.4**: Intersection of the N12 with the N1 ~3 km north of Eskom's** Droeërivier MTS

Photograph 3.5**: Voortrekker St/ R61 ('Aberdeen Road') from the eastern** outskirts of Beaufort West

Potentially affected properties are accessed directly off the N12, the R61, or via the extension of streets intersecting with the R61/ Voortrekker St in Beaufort West. These include the DR 2307 gravel road (Blyth Street extension), which provides a link to the N12 to the east of the Gamka River, and the Vaalkoppies road (Brummer St extension) which provides access to the Vaalkoppies municipal waste site and Hansivier municipal farm (Photograph 3.6).

Photograph 3.6: DR 2307/ Blyth Street, looking south approximately 2 km south of the Beaufort West built edge. The transmission lines are located on Hansrivier 169/5 to the west (left) of the road and Hansrivier municipal farm to the east (right)

Existing service infrastructure is concentrated on the southern outskirts of Beaufort West. This includes the municipal Waste Water Treatment Plant (WWTP), the municipal cemetery, and the Vaalkoppies municipal waste site. As indicated above, municipal boreholes and associated infrastructure are located on a number of properties along the Gamka River and its tributaries. The relevant properties are located to the west of the R61. A number of interviewees indicated that farming on the southern outskirts of the town is becoming untenable. This is linked to chronic theft of stock and infrastructure, and frequent trespassing by informal grazers. The Vaalkoppies waste site is also a major source of litter contamination in its immediate surrounds. Farming operations on at least two properties have been suspended.

Eskom's Droeërivier Main Transfer Station (MTS) is located along the N12 ~3.8 km to the south-west of the Beaufort West built edge. Nine lines (400 kV and 132 kV) currently feed into the MTS from the west, south and east, while a tenth (765 kV) is aligned just to the north of the MTS. Five of the lines are located in two broad corridors located within 2.5 south of the built edge (Photograph 3.7 and 3.8).

Photograph 3.7: **Eskom's Droeërivier MTS** from the N12

Two smaller substations are substations are located on the eastern outskirts of Beaufort West, namely along the N1, and near the intersection of the R61 and the Hopewell gravel road (Photograph 3.8). Two 132 kV lines (actually in- and out-feeding aspects of the same single line) are associated with both substations. The southern and south-eastern approaches to Beaufort West are therefore exposed to five major lines and two existing substations (Photograph 3.9). The relevant area is not considered of great scenic significance. This is largely linked to the largely flat and featureless landscape.

Photograph 3.8: Eskom substation located along the Hopewell Road at the western edge of the Beaufort West smallholding area

Photograph 3.9: Existing 2 x 400 kV line corridor traversing the R61 approximately 5.6 km south-east of Beaufort West

3.6.2 Overview of site and adjacent properties

The grid connection infrastructure for the proposed Bulskop PV SEF cluster of six 120 MW facilities[13] is approximately 300 m wide and 17.5 km long and runs in an east-west direction and connects the six 120 MW PV SEF projects to the Droerivier MTS. The grid connection infrastructure consists of:

- One Eskom collector substation/ switching station.
- One double circuit 132 kV overhead powerline from the Bulskop collector substation/ switching station to the Droerivier Main Transmission Substation (MTS). The height of the powerline will be ~ 32m.

The grid connection crosses the following five properties:

- Remaining Extent of Farm 423.
- Hans Rivier being Portion 5 of Farm No.169.
- Hans Rivier being Portion 4 of Farm No.169.
- Steenrotsfountain being Portion 1 of Farm No.168.
- Weltevreden being Portion 10 of Farm No. 170.

Each of the affected properties are traversed by existing transmission lines. Approximately 9.3 km of the proposed ~17.5 km alignment is located immediately to the south of and parallel to an existing transmission line corridor (2 x 400 kV). The proposed Bulkskop CSS and the 6 120 MW PV SEF that make up the Bulskop PV SEF Cluster are located on Buls Kop 423. The Droeërivier MTS is located on Weltevreden 170/ 10. All of the affected properties are therefore impacted by existing and proposed

[13] Bulskop, Rosenia, Hoodia, Salsola, Gamka and Hardeveld PV SEFs.

transmission lines and infrastructure. The five affected properties are owned by five different land owners (Table 3.1). All five were historically used for stock farming. However, stock farming is currently confined to three of the properties. Three properties currently supply borehole water to the town of Beaufort West.

Table 3.1: Potentially affected properties (from East to West)

PROPERTY	OWNER	LAND USE	RES	COMMENT
423 'Bulskop'	Mr Abrie vd Merwe	Grazing. 6 x SEFs (proposed)	Lessee + 2 staff	Leased out to Mr Willie van Zyl
Farm 169/4 'Hansrivier'	BWLM	No farming. Municipal boreholes	No	Dwelling vacant
Farm 169/5	Mr De Waal (Hansrivier Trust)	No farming. Municipal boreholes	No	Dwellings demolished
Farm 168/1 'Steenrotsfontein'	Mr Natie Nel	Grazing. Municipal boreholes	Owner + 3 staff	Potential SEF
Farm 170/10 'Weltevreden'	Mr Seppie Dereckson	Grazing	Owner	Encloses Droeërivier MTS

A brief overview of the relevant properties and associated direct impacts associated with the proposed transmission line and CSS is provided below.

Bulskop

The proposed Bulskop CSS and easter ~3.5 km section of the proposed 132 kV line is located on Buls Kop 423 (Bulskop). Bulskop is located adjacent to and east of the R61, and directly accessed from the road. The property is owned by Mr Abrie van der Merwe, who resides in Sedgefield. The property is leased to Mr Willie van Zyl. Mr van Zyl and his wife reside on the property in a house Mr van Zyl had recently constructed from prefabricated material (Photograph 3.10). The 2 649-ha farm is used for extensive sheep farming. Two workers are permanently employed on Bulskop and live in a caravan which is moved around the property along with flocks. Mr van Zyl is semi-retired and plans to stop farming in the foreseeable future and move back to his house in town (van Zyl – pers. comm).

Photograph 3.10: Dwelling and kraal on Bulskop seen from the north. The rise to the left effectively screens the dwelling from visual impacts to the east

Two 400 kV lines (one corridor) traverses the western portion of Bulskop, approximately 3.5 km north-west of the dwelling. The six 120 MW PV SEFs associated with the Bulskop PC Cluster are proposed on the eastern portion of the property. The six SEFs occupy 1 471 ha, more than half the property (Photograph 3.122).

Photograph 3.11: Proposed SEF development area in the eastern portion of Bulskop

The proposed Bulskop CSS is located ~1.9 km to the south-south-east of the dwelling. The proposed transmission line corridor is located 230-530 m to the south of the dwelling. The dwelling is shielded from the CSS site by a slight rise.

Hansrivier 169/4

Farm 169/4 ('Hansrivier') is located adjacent to the west of Bulksop, across the R61. Approximately 9.6 km of the proposed transmission line is located on Hansrivier. Primary access is via the extension of Brummer Street (road to municipal refuse site). The property is traversed (W-E) by the Hansrivier, a tributary of the Kuils River. Hansrivier (2 557 ha) was historically used for sheep farming with limited fodder cropping along the river. It has subsequently been acquired by the BWM as a key source of municipal water and a number of municipal boreholes are located on the property. The property is not used for any other purposes. The BWM is currently considering leasing out the property to emerging farmers, but no arrangements have been finalized (Strumpfer – pers comm). Substantial portions of the property boundary are currently unfenced, and the north-eastern portion of the property is exposed to windblown litter from the Vaalkoppies waste site (Photograph 3.12). A farmstead and outbuildings are located on the property. These were used as a drug rehabilitation centre until about two years ago but are currently vacant (Photograph 3.13).

Hansrivier is traversed by five transmission lines (3 corridors). The proposed alignment is located to the south of an existing Eskom corridor (2 x 400 kV). Approximately 5.2 km of the alignment is parallel to and immediately to the south of the relevant corridor. The farm yard on Hansrivier is located 1.1-1.4 km to the south of the proposed new line.

Photograph 3.12: Vaalkoppies waste site viewed from the entrance road to Hansrivier farmstead on Hansrivier

Photograph 3.13: Vacant farmstead and disused outbuildings on Hansrivier

Hansrivier 169/5

Hansrivier 169/5 is located adjacent to the west of Hansrivier 169/4 and is accessed from the DR 2307. The 296-ha property is traversed by both the Gamka and Kuils Rivers. The property belongs to Mr De Waal Nigrin who lives on Renosterkop Farm along the N1, approximately 30 km north of Beaufort West. Hansrivier 169/5 was historically used for grazing and limited fodder cropping as part of the Renosterkop operation. Due to chronic theft, vandalism, and trespassing, farming operations have been terminated and the former dwelling and outbuildings have been demolished by the owner (Photograph 3.14). A number of boreholes are leased out to the Beaufort West municipality. The contract with the municipality prohibits the use of borehole water by the owner for irrigation (Nigrini – pers. comm).

Photograph 3.14: Ruins on Hansrivier 169/5

Approximately 600 m of the proposed transmission line is located on the southernmost portion of Hansrivier 169/5, immediately to the south of and parallel to an existing corridor containing 2 x 400 kV lines. Three more transmission lines traverse the mid-section of the property (Photograph 3.15). The owner has indicated that at least 2 further 132 kV lines associated with other REFs are currently being investigated by private developers (Nigrini – pers. comm).

Photograph 3.15: Existing 400 kV and 765 kV lines of Hansrivier 169/5

Steenrotsfontein

Steenrotsfontein 168/1 is located adjacent to and west of Hansrivier 169/5 and is accessed from the DR 2307. The property is traversed by the Hans- and Gamka Rivers, with the confluence located in the western portion of the property. The 2 068-ha property is owned by Mr Natie Nel who reside on the farm (Photograph 3.16).

Photograph 3.16**: Workers' houses,** outbuildings, and farmstead on Steenrotsfontein, seen from entrance road off the DR 2307

Mr Nel is semi-retired. The sheep farming operation on the property is managed by Mr Nel and his son, Corné (Photograph 3.17). Mr Nel Jr lives in Beaufort West. The operation provides permanent employment for three workers, all of whom live on Steenrotsforntein. As in the case of Hansrivier, a number of boreholes are currently leased out to the Beaufort West Municipality. The contract with the municipality prohibits the use of borehole water by the owner for irrigation. The owners have signed an agreement making the property available for the potential development of an SEF (process status unclear) (Nel – pers. comm).

Five existing transmission lines located in two corridors traverse Steenrotsfontein to the north of the farm house within a distance of 1-2 km (Photograph 3.18). Approximately 3.2 km of the proposed transmission line traverse the property immediately to the south of and parallel to a corridor containing 2 x 400 kV lines, approximately 1.1-1.4 km to the north of the farmstead. The owner has indicated that at least 2 further 132 kV lines from envisaged REFs are currently investigated by private developers (Nel – pers. comm).

Photograph 3.17: Kraal on Steenrotsfontein along the DR 2307

Photograph 3.18: Transmission lines in the extreme north-western portion of Steenrotsfontein, just to the west of the Droeërivier MTS. The proposed corridor is located immediately to the right of the existing lines

Weltevreden

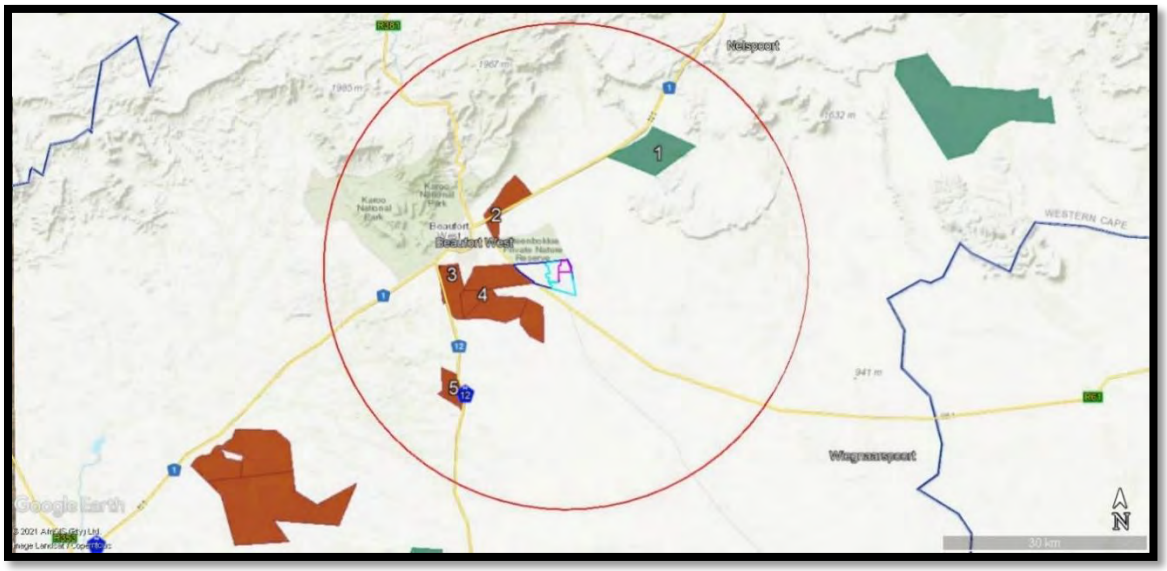
Weltevreden 170/10 is located adjacent to and west of Steenrotsfontein, across the N12 and is accessed off the N12. The 1278-ha property is owned by Mr Seppie Dereckson. Mr Dereckson also owns adjacent portions of Weltevreden 170. The entire Weltevreden farming operation is located to the west of the N12. Weltevreden is traversed by the Gamka and Droeë Rivers. The confluence is located in the westernmost portion of the property. Mr Dereckson and his wife live on the property. A second dwelling ('Weltevreden Suid') on an adjacent portion of the estate is currently leased out to contractors. The property is used for beef cattle farming. All sheep farming has been phased out due to chronic stock theft. No farm labourers reside on the property. Two labourers are transported in daily from Beaufort West (Dereckson – pers. comm). The Eskom Droeërivier MTS is located in the northern portion of Weltevreden 170/10, approximately 2.6 km north-east of the Weltevreden farm house. Nine lines currently feed into the MTS across Weltevreden 170/10 from three directions. The proposed transmission line would traverse Weltevreden over a very short distance only (<150 m) and is located immediately to the south of and parallel to 5 existing lines located within a broad 410 m corridor entering the MTS from the east (Photograph 3.19). The proposed corridor is located approximately 2.5-2.8 km north-east of the dwelling.

Photograph 3.19: Portion of Weltevreden between Droeërivier MTS and the N12 which would be affected by the proposed transmission line (immediately to the left of the nearest line)

3.6.3 Other renewable energy facilities

In terms of other renewable energy facilities in the area, the South African Renewable Energy EIA Application Database (August 2021) indicates that there are five applications located within a 35 km radius of the Bulskop PV SEF Cluster (Figure 3.3).

The Bulkskop SEF Cluster consists of six proposed 120 MW SEFs all located on Bulskop Farm. The six facilities would make use of the same transmission infrastructure to link up to the Droeërivier MTS located to the west of the site. Based on the information contained on the SA Renewable Energy database most of the applications are for solar PV (Table 3.2). None of the relevant projects have been constructed yet. The status of all the relevant projects is unclear.



Source: South African Renewable Energy EIA Application Database[14]

Figure 3.3: Renewable energy applications within a 35 km radius of the Bulskop SEF Cluster outlined in light blue, and Buls Kop 423 in dark blue

Table 3.2. Other REFs within 35 km of the Bulskop PV SEF Cluster

	NAME	TYPE	MW	APPLIED	STATUS	DEVELOPER
1	Beaufort West	WEF	0	???	To Review	Terra Wind
2	Beaufort West PV Park	PV SEF	0	2019	Unclear	EAB Astrum Energy
3	Steenrotsfontein	PV SEF	19	2012	Unclear	Laruma
4	Unnamed facility on 5 properties	PV SEF	0	2012	Unclear	???
5	Lombardskraal	WEF + PV SEF	20	2013	Unclear	???

Source: South African Renewable Energy EIA Application Database

14 https://portal.environment.gov.za/portal/apps/webappviewer/index.html?id=1c45081a7f65490c9ce58fad88e3b9e3.

SECTION 4: ASSESSMENT OF KEY SOCIAL ISSUES

4.1 INTRODUCTION

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

- Review of project related information.
- Review of key policy and planning documents.
- Site visit to the study area and comments submitted by key stakeholders.
- Experience/ familiarity of the authors with the area and local conditions.
- Experience with similar projects.

The assessment section is divided into the following sections:

- Assessment of compatibility with relevant policy and planning context ("planning fit".
- Assessment of social issues associated with the construction phase.
- Assessment of social issues associated with the operation phase.
- Assessment of the "no development" alternative.
- Assessment of cumulative impact on sense of place.

4.2 ASSESSMENT OF POLICY AND PLANNING FIT

The findings of the SIA indicate that investment in renewable energy and the associated energy infrastructure is strongly supported at a national, provincial, and local level. The development of and investment in renewable energy and associated energy distribution infrastructure is supported by the National Development Plan (NDP), New Growth Path Framework and National Infrastructure Plan, which all highlight the importance of energy security and investment in energy infrastructure. The development of renewable energy is also supported by the BWM IDP and SDF.

The proposed site is also located within the Beaufort West REDZ and Central Transmission Corridor. The area has therefore been identified as suitable for the establishment of large-scale solar energy facilities and associated transmission infrastructure. The development of the proposed grid connection infrastructure is therefore supported by key policy and planning documents.

4.3 CONSTRUCTION PHASE SOCIAL IMPACTS

Potential positive impacts

- Creation of employment and business opportunities.

Potential negative impacts

- Impacts associated with the presence of construction workers on local communities.
- Impact on local farmers and farming operations.
- Noise, dust and safety impacts of construction related activities and vehicles.

4.3.1 Creation of local employment, training, and business opportunities

The construction phase of for the grid infrastructure including the connection to the Droerivier MTS Substation is expected to extend over a period of approximately 12 months and create in the region of 60 employment opportunities. Approximately 40% of the jobs will benefit low-skilled workers, 40% semi-skilled and 20% high skilled. Most of the low and semi-skilled employment opportunities would benefit local communities in the area, specifically Beaufort West. The majority of these employment opportunities are also likely to accrue to Historically Disadvantaged (HD) members from these local communities.

Given high local unemployment levels and limited job opportunities in the area, this will represent a significant, if localised, social benefit. The remainder of the skilled employment opportunities are likely to be associated with the contactors appointed to construct the grid infrastructure. However, in the absence of specific commitments from the developer to maximise local employment targets the potential opportunities for local employment will be limited. The proponent should therefore commit to employing as many local community members as possible.

The total wage bill for the construction of the grid infrastructure is estimated to be in the region of R 10 million (2021 Rand value). This is based on the assumption that the average monthly salary R 8 000, R 12 000 and R 30 000 for low skilled-semi-skilled and skilled workers respectively for a period of 12 months. A percentage of the wage bill will be spent in the local economy which will also create opportunities for local businesses in Beaufort West.

The capital expenditure associated with the construction of grid infrastructure will create opportunities for local companies and the regional and local economy. Implementing the enhancement measures listed below can enhance these opportunities. The sector of the local economy that is most likely to benefit from the proposed development is the local service industry. The potential opportunities for the local service sector 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 is also likely to benefit from the provision of accommodation and meals for professionals (engineers, quantity surveyors, project managers, product representatives etc.) and other (non-construction) personnel involved on the project. Experience from other construction projects indicates that the potential opportunities are not limited to on-site construction workers but also to consultants and product representatives associated with the project.

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

Nature: Creation of employment and business opportunities during the construction phase		
	Without Mitigation	With Enhancement
Extent	Local (2)	Local-Regional (3)
Duration	Short term (2)	Short term (2)
Magnitude	Low (4)	Moderate (6)
Probability	Probable (3)	Highly probable (4)
Significance	Low (24)	Medium (44)
Status	Positive	Positive
Reversibility	N/A	N/A
Irreplaceable loss of resources?	N/A	N/A
Can impact be enhanced?	Yes	
Enhancement: See below		
Residual impacts: Opportunity to up-grade and improve skills levels in the area.		

Assessment of No-Go option

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

Recommended enhancement measures

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

Employment

- 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 BWM 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 BWM 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.

Most of the low and semi-skilled workers are likely to be locally based and form part of the local family and social network. The total number of workers will also be low, namely ~ 60. The potential impact of construction workers on the local community is therefore likely to be negligible.

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

Nature: Potential impacts on family structures and social networks associated with the presence of construction workers		
	Without Mitigation	With Mitigation
Extent	Local (2)	Local (1)
Duration	Short term (2)	Short term (2)
Magnitude	Low (4)	Minor (2)
Probability	Probable (3)	Probable (3)
Significance	Low (24)	Low (15)
Status	Negative	Negative
Reversibility	No in case of HIV and AIDS	No in case of HIV and AIDS
Irreplaceable loss of resources?	Yes, if people contract HIV/AIDS.	
Can impact be mitigated?	Yes, to some degree. However, the risk cannot be entirely eliminated	
Mitigation: See below		
Residual impacts: Impacts on family and community relations that may, in some cases, persist for a long period of time. Also, in cases where unplanned / unwanted pregnancies occur or members of the community are infected by an STD, specifically HIV and or AIDS, the impacts may be permanent and have long term to permanent cumulative impacts on the affected individuals and/or their families and the community.		

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

Recommended mitigation measures
The potential risks associated with construction workers can be mitigated. The detailed mitigation measures should be outlined in the Environmental Management Plan (EMP) for the Construction Phase. Aspects that should be covered include:

- 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 the contractor(s) should develop a code of conduct for the construction phase. 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 proponent and the contractor should implement an HIV/AIDS awareness programme for all construction workers at the outset of the construction phase.
- The contractor should provide transport for workers to and from the site on a daily basis. This will enable the contactor to effectively manage and monitor the movement of construction workers on and off the site.

- The contractor must ensure that all construction workers from outside the area are transported back to their place of residence within 2 days for their contract coming to an end.
- No construction workers, with the exception of security personnel, should be permitted to stay over-night on the site.

4.3.3 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. The potential risks (safety, livestock, and farm infrastructure) can be effectively mitigated by careful planning and managing the movement of construction workers on the site during the construction phase. Mitigation measures to address these risks are outlined below.

The findings of the SIA also indicate that stock farming in the area has been significantly affected by stock theft due to the proximity of the farms to Beaufort West. No farming currently takes place on two of the five site properties, while limited stock farming operations continue on the remaining three. The impacts are therefore likely to be negligible.

Table 4.3: Assessment of risk to safety, livestock, and damage to farm infrastructure

Nature: Potential risk to safety of farmers and farm workers, livestock and damage to farm infrastructure associated with the presence of construction workers on site		
	Without Mitigation	With Mitigation
Extent	Local (2)	Local (1)
Duration	Short term (2)	Short term (2)
Magnitude	Low (4)	Low (4)
Probability	Probable (3)	Probable (3)
Significance	Low (24)	Low (21)
Status	Negative	Negative
Reversibility	Yes, compensation paid for stock losses and damage to farm infrastructure etc.	Yes, compensation paid for stock losses and damage to farm infrastructure etc.
Irreplaceable loss of resources?	No	No
Can impact be mitigated?	Yes	
Mitigation: See below		
Residual impacts: No, provided losses are compensated for.		

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

Recommended mitigation measures

- 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.
- Traffic and activities should be strictly contained within designated areas.
- Strict traffic speed limits must be enforced on the farm.
- 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. This would reduce the potential risk of trespassing on the remainder of the farm and adjacent properties.
- The proponent should consider the option of establishing a MF (see above) that includes local farmers and develop a Code of Conduct for construction workers. This committee should be established prior to commencement of the construction phase. The Code of Conduct should be signed by the proponent and the contractors before the contractors move onto site.
- 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 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 Code of Conduct. 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.

4.3.4 Impacts associated with construction related activities

The establishment of the grid infrastructure including the movement of heavy construction has the potential to damage impact on grazing land and create noise, dust, and safety impacts for other road users in the area. The potential risks can be effectively mitigated by careful planning and managing the movement of construction workers on the site during the construction phase. Mitigation measures to address these risks are outlined below.

As indicated above, stock farming in the area has been significantly affected by stock theft due to the proximity of the farms to Beaufort West and no farming currently takes place on two of the five site properties, while limited stock farming operations continue on the remaining three. The impacts are therefore likely to be negligible.

Table 4.4: Assessment of the impacts associated with construction vehicles

Nature: Potential noise, dust and safety impacts associated with movement of construction related activities and movement of traffic to and from the site		
	Without Mitigation	With Mitigation
Extent	Local-Regional (2)	Local (1)
Duration	Short term (2)	Short term (2)
Magnitude	Low (4)	Low (4)
Probability	Probable (3)	Probable (3)
Significance	Low (24)	Low (21)
Status	Negative	Negative
Reversibility	Yes	
Irreplaceable loss of resources?	No	No
Can impact be mitigated?	Yes	
Mitigation: See below		
Residual impacts: If damage to local roads is not repaired then this will affect the other road users and result in higher maintenance costs. The costs will be borne by road users who were no responsible for the damage.		

Assessment of No-Go option

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

Recommended mitigation measures

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

- As indicated above, the proponent should consider the establishment of a Monitoring Forum (MF) to monitor the construction phase and the implementation of the recommended mitigation measures. The MF should be established before the construction phase commences, and should include key stakeholders, including representatives from local communities, local BWM representatives, farmers, and the contractor(s). The MF should also address issues associated with damage to roads and other construction related impacts.
- Ongoing communication with land owners and road users during construction period.
- Establishment of a Grievance Mechanism that provides local farmers and other road users with an effective and efficient mechanism to address issues related to construction traffic related damage to roads.
- Implementation of a road maintenance programme throughout the construction phase to ensure that the affected roads maintained in a good condition.
- 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 sand and 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.

4.4 OPERATIONAL PHASE SOCIAL IMPACTS

The findings of the SIA indicate that the social impacts associated with the collector substation/ switching station will be negligible. The impacts associated with the overhead transmission line will also be limited, specifically within in the context of the proposed PV SEF projects. The following key social issues are of relevance to the operational phase:

Potential positive impacts
- Improved energy security and establishment of energy infrastructure.
- Creation of employment opportunities.

Potential negative impacts
- The visual impacts and associated impact on sense of place.
- Impact of maintenance activities on farming activities and operations.

4.4.1 Improved energy security and establishment of energy infrastructure

The grid connection infrastructure associated with the Bulskop PV SEF Cluster is essential to enable the development and operation of the Suite. The primary goal of the proposed Bulskop PV SEF Cluster is to improve energy security in South Africa by generating renewable energy. The grid connection infrastructure should therefore be viewed within the context of the South Africa's current power supply constraints and the reliance on coal powered energy to meet most of its energy needs.

South Africa's energy crisis, which started in 2007 and is ongoing, has resulted in widespread rolling blackouts (referred to as load shedding) due to supply shortfalls. The load shedding has had a significant impact on all sectors of the economy and on investor confidence. The mining and manufacturing sector have been severely impacted and will continue to be impacted until such time as there is a reliable supply to energy. Load shedding in the first six months of 2015 was estimated to have cost South African businesses R13.72 billion in lost revenue with an additional R716 million was spent by businesses on backup generators[15]. A survey of 3 984 small business owners found that 44% said that they had been severely affected by load shedding with 85% stating that it had reduced their revenue, with 40% of small businesses losing 20% or more or revenue during due to load shedding period[16].

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

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

Table 4.5: Improve energy security, reduce reliance on coal generated power sector

Nature: Development of infrastructure to improve energy security and reduce reliance on coal		
	Without Mitigation	With Mitigation
Extent	Local, Regional and National (4)	Local, Regional and National (4)
Duration	Long term (4)	Long term (4)
Magnitude	Moderate (6)	Moderate (6)
Probability	Highly Probable (4)	Definite (5)
Significance	Medium (56)	High (70)
Status	Positive	Positive
Reversibility	Yes	
Irreplaceable loss of resources?	Yes, impact of climate change on ecosystems	Reduced CO_2 emissions and impact on climate change
Can impact be mitigated?	Yes	
Enhancement: See below		
Residual impacts: Improved energy security and benefit for economic development and investment, reduction in CO_2 emission and reduction in water consumption for energy generation.		

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

Recommended mitigation measures
Should the proposed grid connection infrastructure be approved the proponent should:

- 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 opportunities

The potential employment opportunities associated with the substation and associated grid connection infrastructure will be limited and largely confined to periodic maintenance and repairs. The potential socio-economic benefits will therefore be limited.

Table 4.6: Impact assessment of employment and business creation opportunities

Nature: Creation of employment and business opportunities associated with the operational phase		
	Without Mitigation	With Enhancement
Extent	Local and Regional (1)	Local and Regional (2)
Duration	Long term (4)	Long term (4)
Magnitude	Minor (2)	Minor (2)
Probability	Probable (3)	Probable (3)
Significance	Low (21)	Low (24)
Status	Positive	Positive
Reversibility	N/A	
Irreplaceable loss of resources?	No	
Can impact be enhanced?	Yes	
Enhancement: See below		
Residual impacts: Creation of permanent employment and skills and development opportunities for members from the local community and creation of additional business and economic opportunities in the area		

Recommended enhancement measures

The enhancement measures listed in Section 4.4.1, i.e., to enhance local employment and business opportunities during the construction phase, also apply to the operational phase.

4.4.3 Visual impact and impact on sense of place

The establishment of the grid connection infrastructure, specifically the overhead transmission line, has the potential to impact on the area's sense of the place. However, the sense of place has been impacted by several existing transmission lines associated with the Droerivier MTS and two smaller substations in the area. The impact on the areas sense of place should also be considered within the context that the site is located within the Beaufort West REDZ and Central Transmission Corridor. The area has therefore been identified as suitable for the establishment of large, renewable energy facilities and associated infrastructure. The impact on sense of place is therefore likely to be limited.

Table 4.7: Visual impact and impact on sense of place

Nature: Visual impact associated with the proposed grid infrastructure and the potential impact on the area's sense of place.		
	Without Mitigation	With Mitigation
Extent	Local (2)	Local (1)
Duration	Long term (4)	Long term (4)
Magnitude	Minor (2)	Minor (2)
Probability	Probable (3)	Probable (3)
Significance	Low (24)	Low (21)
Status	Negative	Negative
Reversibility	Yes, transmission line and substations can be removed.	
Irreplaceable loss of resources?	No	
Can impact be mitigated?	Yes	
Mitigation: See below		
Residual impacts: Potential impact on current rural sense of place		

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

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

4.3.5 Impact on farming operations during maintenance

The presence on and movement of maintenance workers on and off the site poses a potential risk to farming operations. Farm fence and gates may be damaged and stock losses may also result from gates being left open. The presence of maintenance workers on the site increases the exposure of their farming operations and livestock to the outside world, which, in turn, increased the potential risk of stock theft and crime. The local farmers did, however, indicate that the potential risks can be effectively mitigated by ensuring the maintenance teams take care to ensure that gates are kept closed and affected property owners are kept informed about timing of maintenance operations. Mitigation measures to address these risks are outlined below.

As indicated above, stock farming in the area has been significantly affected by stock theft due to the proximity of the farms to Beaufort West and no farming currently takes place on two of the five site properties, while limited stock farming operations continue on the remaining three. The impacts are therefore likely to be low with effective mitigation.

Table 4.8: Assessment of risk to farming operations and damage to farm infrastructure

Nature: Potential risk to safety to farming operations and livestock associated with the presence of maintenance workers on the site		
	Without Mitigation	With Mitigation
Extent	Local (3)	Local (2)
Duration	Short term (2)	Short term (2)
Magnitude	Medium (6)	Low (4)
Probability	Probable (3)	Probable (3)
Significance	Medium (33)	Low (24)
Status	Negative	Negative
Reversibility	Yes, compensation paid for stock losses and damage to farm infrastructure etc.	Yes, compensation paid for stock losses and damage to farm infrastructure etc.
Irreplaceable loss of resources?	No	No
Can impact be mitigated?	Yes	
Mitigation: See below		
Residual impacts: No, provided losses are compensated for.		

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

Recommended mitigation measures
- Affected property owners should be notified in advance of the timing and duration of maintenance activities.
- Maintenance teams must ensure that all farm gates must be closed after passing through.
- Property owners should be compensated for damage to farm property and or loss of livestock or game associated maintenance related activities.
- Movement of traffic and maintenance related activities should be strictly contained within designated areas associated with transmission lines and substations.
- Strict traffic speed limits must be enforced on the farm.
- No maintenance workers should be allowed to stay over-night on the affected properties.

4.5 CUMULATIVE IMPACT ON SENSE OF PLACE

The Scottish Natural Heritage (2005) describes a range of potential cumulative landscape impacts associated with wind farms on landscapes. These issues raised in these guidelines as to what defines a cumulative impact are also regarded as pertinent to transmission lines. The relevant issues identified by Scottish Natural Heritage study include:

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

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

As indicated above, there are several existing transmission lines associated with the Droerivier MTS and two smaller substations in the area. The potential for combined and sequential visibility is therefore high. However, the grid infrastructure is located within the Beaufort West REDZ and Central Transmission Corridor. The area has therefore been identified as suitable for the establishment of large, renewable energy facilities and associated infrastructure.

Table 4.9: Cumulative impacts on sense of place and the landscape

Nature: Visual impacts associated with the establishment of associated grid infrastructure and the potential impact on the area's rural sense of place and character of the landscape.		
	Overall impact of the proposed project considered in isolation	Cumulative impact of the project and other projects in the area
Extent	Local (1)	Local (2)
Duration	Long term (4)	Long term (4)
Magnitude	Low (4)	Moderate (6)
Probability	Probable (3)	Probable (3)
Significance	Low (27)	Moderate (36)
Status (positive/negative)	Negative	Negative
Reversibility	High, transmission line can be removed.	
Loss of resources?	No	No
Can impacts be mitigated?	Yes	
Confidence in findings: High.		
Mitigation: See below		

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

Recommended mitigation measures
The recommendations of the VIA should be implemented.

4.6 CUMULATIVE IMPACT ON LOCAL SERVICES AND ACCOMMODATION

The establishment of the proposed grid infrastructure for the proposed Bulskop PV SEF Cluster and other renewable energy facilities in the BWM has the potential to place pressure on local services in Beaufort West, specifically services such as medical, education and accommodation. This pressure will be associated with the influx of

workers to the area associated with the construction and operational phases of renewable energy projects proposed in the area, including the proposed grid infrastructure. The potential impact on local services can be mitigated by employing local community members. However, due to the low education and skills levels in the area there is likely to be a need to implement a training and skills development programme to ensure that local employment opportunities are maximised. The presence of non-local workers during both the construction and operation phase may also place pressure on property prices and rentals. As a result, local residents, such as government officials, such as municipal workers, school teachers, and the police, may no longer be able to buy or afford to rent accommodation in Beaufort West.

However, as indicated below, this impact should also be viewed within the context of the potential positive cumulative impacts for the local economy associated with the establishment of a renewable energy hub in the area. These benefits will create opportunities for investment in Beaufort West and the BWM, including the opportunity to up-grade and expand existing services and the construction of new houses. In this regard the establishment of a renewable energy hub will create a unique opportunity for Beaufort West and the BWM.

The Community Trusts associated with each project will generate revenue that can be used by the BWM 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 BWM.

Table 4.10: Cumulative impacts on local services

Nature: The establishment of renewable energy facilities and associated grind infrastructure in the Beaufort West REDZ will place pressure on local services in local towns in the area, specifically medical, education and accommodation.		
	Overall impact of the proposed project considered in isolation	Cumulative impact of the project and other projects in the area
Extent	Local (1)	Local and regional (2)
Duration	Long term (4)	Long term (4)
Magnitude	Low (4)	Moderate (6)
Probability	Probable (3)	Probable (3)
Significance	Low (27)	Medium (36)
Status (positive/negative)	Negative	Negative
Reversibility	Yes. Solar energy plant components and other infrastructure can be removed.	
Loss of resources?	No	No
Can impacts be mitigated?	Yes	
Confidence in findings: High.		
Mitigation: See below		

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

Recommended mitigation measures
The Western Cape Provincial Government, in consultation with the BWM, CKDM and the proponents involved in the development of renewable energy projects in the Beaufort West REDZ should consider establishing a Development Forum to co-ordinate and manage the development and operation of renewable energy projects in the area with the specific aim of mitigating potential negative impacts and enhancing opportunities. This would include identifying key needs, including capacity of existing services, accommodation and housing and the implementation of an accredited training and skills development programmes aimed at maximising the opportunities for local workers to be employed during the construction and operational phases of the various proposed projects. These issues should be addressed in the Integrated Development Planning process undertaken by the BWM.

4.7 CUMULATIVE IMPACT ON LOCAL ECONOMY

In addition to the potential negative impacts, the establishment of a renewable energy hub and associated grid infrastructure will create a number of socio-economic opportunities for the BWM, which, in turn, will result in a positive social benefit. The positive cumulative impacts include creation of employment, skills development and training opportunities, and downstream business opportunities.

The Overview of the REIPPP (2020) confirms the benefits associated with renewable energy projects for local and regional economies. In this regard R 1.2 billion has been generated by socio-economic development contributions associated with the 68 operational IPPs. IPPs have supported 1 123 education institutions with a total of R312 million in contributions, from 2015 to the end of June 2020. A total of 1 142 bursaries, amounting to R183.8 million, have been awarded by 55 IPPs from 2015 until the end of June 2020. The largest portion of the bursaries were awarded to African and Coloured students (97%), with women and girls receiving 56% of total bursaries. The Northern Cape province benefitted most from the bursaries awarded, with 61%, followed by the Eastern Cape (18%) and Western Cape (14%). Enterprise development and social welfare are the focus areas that have received the second highest share of the contributions to date.

In addition, enterprise development contributions committed for BW1 to BW4, 1S2 and 2S2 amount to R7.2 billion. Assuming an equal distribution of revenue over the 20-year project operational life, enterprise development contributions would be R360 million per annum. Of the total commitment, R5.6 billion is specifically committed directly within the local communities where the IPPs operate, contributing significantly to local enterprise development. Up until the end of June 2020 a total of R 384.2 million had already been made to the local communities located in the vicinity of the 68 operating IPPs.

The potential cumulative benefits for the local and regional economy are therefore associated with both the construction and operational phase of renewable energy projects and extend over a period of 20-25 years.

Table 4.11: Cumulative impacts on local economy

Nature: The establishment of renewable energy facilities and associated grid infrastructure in the Beaufort West REDZ will create employment, skills development and training opportunities, creation of downstream business opportunities.		
	Overall impact of the proposed project considered in isolation	Cumulative impact of the project and other projects in the area
Extent	Local and regional (2)	Local and regional (4)
Duration	Long term (4)	Long term (4)
Magnitude	Low (4)	Moderate (6)
Probability	Highly Probable (4)	Definite (5)
Significance	Medium (44)	High (70)
Status (positive/negative)	Positive	Positive
Reversibility	Yes. Solar energy plant components and other infrastructure can be removed.	
Loss of resources?	No	No
Can impacts be mitigated?	Yes	
Confidence in findings: High.		
Mitigation: See below		

Comment on No-Go option

There is no impact as it maintains the current status quo. This would represent a lost socio-economic opportunity for the BWM.

Recommended mitigation measures

The proposed establishment of suitably sited renewable energy facilities and associated grid infrastructure within the Beaufort West REDZ and Central Transmission Corridor is supported.

4.8 ASSESSMENT OF NO-DEVELOPMENT OPTION

The proposed substation and grid connection infrastructure is essential to enable the Bulskop PV SEF Cluster to connect to the national electricity grid to address the current energy supply constraints and reduce South Africa's reliance on coal generated energy. As indicated above, energy supply constraints and associated load shedding have had a significant impact on the economic development of the South African economy. South Africa also relies on coal-powered energy to meet more than 90% of its energy needs. South Africa is therefore one of the highest per capita producers of carbon emissions in the world and Eskom, as an energy utility, has been identified as the world's second largest producer of 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 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. In addition, all of the socio-economic

benefits (employment opportunities, local economic development etc.) associated with the grid connection and the Bulskop PV SEF Cluster would be foregone.

Table 4.12: Assessment of no-development option

Nature: The no-development option would result in the lost opportunity for South Africa to improve energy security and reduce reliance on coal power.		
	Without Mitigation[17]	With Mitigation[18]
Extent	Local-International (4)	Local-International (4)
Duration	Long term (4)	Long term (4)
Magnitude	Moderate (6)	Moderate (6)
Probability	Highly Probable (4)	Highly Probable (4)
Significance	Moderate (56)	Moderate (56)
Status	Negative	Positive
Reversibility	Yes	
Irreplaceable loss of resources?	Yes, impact of climate change on ecosystems	
Can impact be mitigated?	Yes	
Enhancement: See below		
Residual impacts: Improved energy security and benefit for economic development and investment, reduction in CO_2 emission and reduction in water consumption for energy generation.		

Recommended enhancement measures

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

[17] Assumes project is not developed

[18] Assumes project is developed

SECTION 5: KEY FINDINGS AND RECOMMENDATIONS

5.1 INTRODUCTION

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

- A review of key planning and policy documents pertaining to the area
- Site visit and semi-structured interviews with interested and affected parties.
- A review of social and economic issues associated with similar developments.
- A review of relevant literature on social and economic impacts.
- The experience of the authors with other renewable energy projects in South Africa

5.2 SUMMARY OF KEY FINDINGS

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

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

5.2.1 Policy and planning issues

The findings of the SIA indicate that investment in renewable energy and the associated energy infrastructure is strongly supported at a national, provincial, and local level. The development of and investment in renewable energy and associated energy distribution infrastructure is supported by the National Development Plan (NDP), New Growth Path Framework and National Infrastructure Plan, which all highlight the importance of energy security and investment in energy infrastructure. The development of renewable energy is also supported by the BWM IDP and SDF.

The proposed site is also located within the Beaufort West REDZ and Central Transmission Corridor. The area has therefore been identified as suitable for the establishment of large-scale solar energy facilities and associated transmission infrastructure. The development of the proposed grid connection infrastructure is therefore supported by key policy and planning documents.

5.2.2 Construction phase impacts

The key social issues associated with the construction phase include:

Potential positive impacts

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

The construction phase will extend over a period of approximately 12 months and create in the region of 60 employment opportunities. The total wage bill will be in the region of R 10 million (2021 Rand values). Most of the low and semi-skilled employment opportunities are likely to benefit residents from Beaufort West the majority of whom are likely to be historically disadvantaged (HD) members of the community. This would represent a short term positive social benefit in an area with limited employment opportunities. A percentage of the wage bill will be spent in the local economy which will also create opportunities for local businesses in Beaufort West.

The capital expenditure associated with the construction of grid connection infrastructure will create opportunities for local companies and the regional and local economy. The sector of the local economy most likely to benefit from the proposed development is the local service industry. The potential opportunities for the local service sector would be linked to accommodation, catering, cleaning, transport, and security, etc. associated with the construction workers on the site.

Potential negative impacts

- Impacts associated with the presence of construction workers on local communities.
- Noise, dust, and safety impacts of construction related activities and vehicles.
- Risks posed to farming activities by construction workers.

The findings of the SIA indicate that the significance of the potential negative impacts is likely to be negligible. With mitigation they are rated as Low Negative. The potential negative impacts associated with the proposed transmission lines and substations 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	Low (Negative)	Low (Negative)
Impact of construction activities and vehicles	Low (Negative)	Low (Negative)
Safety risk, stock theft and damage to farm infrastructure associated with presence of construction workers	Low (Negative)	Low (Negative)

5.2.3 Operational phase impacts

The benefits associated with the Bulskop PV SEF Cluster are dependent upon being able to connect to the national grid.

The key social issues associated with the operational phase include:

Potential positive impacts
- Improve energy security and establishment of energy infrastructure.
- Creation of employment opportunities.

Potential negative impacts
- The visual impacts and associated impact on sense of place.
- Risks posed to farming activities by maintenance workers.

The findings of the SIA indicate that the significance of the potential negative impacts is likely to be negligible. With mitigation they are rated as Low Negative. The potential negative impacts associated with the proposed transmission lines and substations can therefore be effectively mitigated if the recommended mitigation measures are implemented.

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
Improve energy security and establishment of energy infrastructure	High (Positive)	High (Positive)
Creation of employment and business opportunities during maintenance	Low (Positive)	Low (Positive)
Visual impact and impact on sense of place	Low (Negative)	Low (Negative)
Safety risk, stock theft and damage to farm infrastructure associated with presence of maintenance	Medium (Negative)	Low (Negative)

5.2.4 Cumulative impacts

Cumulative impact on sense of place
There are a number of other power lines located and proposed in the vicinity of the grid connection infrastructure. The potential for cumulative impacts associated with combined visibility (whether two or more power lines will be visible from one location) and sequential visibility (e.g., the effect of seeing two or more power lines along a single journey, e.g., road or walking trail) does therefore exist. The site is however located within the Beaufort West REDZ and Central Transmission Corridor. The area has therefore been identified as suitable for the establishment of the renewable energy facilities and associated grid infrastructure.

Cumulative impact on local services and accommodation
The significance of this impact with mitigation was rated as Low Negative.

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

5.2.5 Assessment of no-development option

The No-Development option would represent a lost opportunity for South Africa to improve energy security and supplement is current energy needs with 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 CONCLUSIONS AND RECOMMENDATIONS

The energy security benefits associated with the proposed Bulskop PV SEF Cluster are dependent upon it being able to connect to the national grid via the establishment of grid connection infrastructure.

The findings of the SIA indicate that the significance of the potential negative social impacts associated with the grid infrastructure for the Bulskop PV SEF Cluster for both the construction and operational phase are Low Negative with mitigation. The potential negative impacts can therefore be effectively mitigated if the recommended mitigation measures are implemented.

The site is also located within the Beaufort West REDZ and Central Transmission Corridor. The area has therefore been identified as being suitable for the establishment of large-scale renewable energy facilities and the associated grid connection infrastructure. The establishment of the grid infrastructure associated with the proposed Bulskop PV SEF Cluster is therefore supported by the findings of the SIA.

ANNEXURE A

INTERVIEWS

- Dereckson, Mr Seppie (2021-10-08). Weltevreden 170/10.
- Herselma, Ms Sunel (2021-10-08). Steenbokkie PNR.
- Nel, Mr Natie (2021-10-08). Steenrotsfontein 168/1.
- Nigrini, Mr De Waal (2021-10-08). Owner Hansrivier 169/5.
- Strumpfer, Mr (telephonic 2021-10-06). Beaufort West Municipality: Municipal Properties (Hansrivier 169/4).
- Van der Merwe, Mr Abrie (telephonic 2021-10-05). Owner: Buls Kop 423.
- Van Zyl, Mr Willie (2021-10-09). Bulskop farm lessee.

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 Resource Plan (IRP) for South Africa (2019).
- The National Development Plan (2011).
- New Growth Path Framework (2010).
- National Infrastructure Plan (2012).
- National Integrated Energy Plan (2016)
- White Paper on Sustainable Energy for the Western Cape Province (2010).
- The Western Cape Provincial Strategic Plan 2014-2019 (2014).
- The Western Cape Land Use Planning Act, 2014.
- The Western Cape Provincial Spatial Development Framework (2014 Revision).
- The Western Cape Climate Change Response Strategy (2014).
- The Western Cape Infrastructure Framework (2013).
- The Western Cape Green Economy Strategy Framework (2013).
- The One Cape 2040 Strategy (2012).
- The Western Cape Amended Zoning Scheme Regulations for Commercial Renewable Energy Facilities (2011).
- The Western Cape Draft Strategic Plan (2010).
- Beaufort West Municipality Integrated Development Plan (IDP)(2019/2020).
- Beaufort West Spatial Development Framework (SDF)(2013).

ANNEXURE B

METHODOLOGY FOR THE ASSESSMENT OF POTENTIAL IMPACTS

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

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

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

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

S = Significance weighting
E = Extent

D = Duration
M = Magnitude
P = Probability

The significance weightings for each potential impact are as follows:

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

ANNEXURE C

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

Tony Barbour's has 28 years' experience as an environmental consultant, including 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, Mozambique, Mauritius, Kenya, Ethiopia, Oman, South Sudan, Senegal, 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):

4 April 2021

Date: