SOCIO-ECONOMIC IMPACT ASSESSMENT FOR THE RHINO PV FACILITY ON REMAINDER OF FARM RHENOSTERKOP 155 AND SUNNYSIDE PV FACILITY ON REMAINDER OF FARM 400, BEAUFORT WEST IN THE WESTERN CAPE PROVINCE

Impact Assessment Report – Rhino PV and Sunnyside PV Facilities

Prepared by:

URBAN-ECON
Development Economists

Prepared for:

SiVEST
Established 1952

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ABBREVIATIONS

AOI	Area of Influence
BA	Basic Assessment
BCI	Business Confidence Index
CAGR	Compound Average Growth Rate
CLO	Client Liaison Officer
EMPr	Environmental Management Programme
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GVA	Gross Value Added
GWh	Gigawatt-hours
IDP	Integrated Development Plan
IISD	International Institute for Sustainable Development
IRP	Integrated Resource Plan
JET	Just Energy Transition
JET IP	Just Energy Transition Implementation Plan
MTS	Main Transmission Substation
MW	Mega Watt
NERSA	National Energy Regulator South Africa
PV	Photovoltaic
REIPPPP	Renewable Energy Independent Power Producer Procurement Programme
SACCI	South African Chamber of Commerce and Industry
SEF	Solar Energy Facility
SEIA	Social-Economic Impact Assessment
TFEC	Total Final Energy Consumption
TIPS	Trade & Industry Policy Strategies
WGBI	World Government Bond Index

SPECIALIST DETAILS

Company Name:	**Urban-Econ Development Economists (Pty)Ltd**
Company Profile:	**URBAN-ECON** Development Economists (Pty) Ltd is a professional consultancy firm specialising in the field of development economics. Development economics, as advocated by URBAN-ECON, refers to the field of research where spatial principles are applied in an economic context. **URBAN-ECON** combines specialised skills, extensive experience, professional ethics and personal service delivery to provide appropriate and practical economically viable solutions. A personal approach in efficient service delivery ensures that project deliverables align with the clients' needs, therefore equipping the client with the necessary knowledge to make informed decisions.
Economic Assessment Practitioner Managing the Report	**Pierre van Jaarsveld** Cell: +27 82 828 9374 Email: pierre@urban-econ.com Position: Manager Qualification: B.TRP HONS (Town and Regional Planning) Membership: Economic Society of South Africa (ESSA) #00116 Experience: 15 Years Brief Profile: **Pierre van Jaarsveld** completed his B.TRP Town and Regional Planning degree at the University of Pretoria, South Africa. His expertise lies in property market analysis, economic impact assessment, feasibility analysis, project management, and project implementation. He built up valuable experience in Local Economic Development, agricultural development, enterprise development and impact modelling. He has managed projects for various property and economic studies, such as integrated housing projects and socio-economic impact assessments. He has also facilitated a number of urban and rural renewal and development projects focusing on job creation opportunities and broadening the local economic base through investment attraction in bankable projects. Pierre currently serves as manager of infrastructure projects as well as of Urban-Econ in Mpumalanga and is responsible for the day-to-day operations of the office.

SPECIALIST REPORT REQUIREMENTS

Appendix 6 of the Environmental Impact Assessment Regulations, 2014 as amended, enacted under the National Environmental Management Act, 1998 (Act 107 of 1998) as amended	Section of Report
1. (1) A specialist report prepared in terms of these Regulations must contain- a) details of- i. the specialist who prepared the report; and ii. the expertise of that specialist to compile a specialist report including a curriculum vitae;	Specialist Details (Above) Appendix C
b) a declaration that the specialist is independent in a form as may be specified by the competent authority;	Appendix D
c) an indication of the scope of, and the purpose for which, the report was prepared;	Section 1
(cA) an indication of the quality and age of base data used for the specialist report;	Section 1
(cB) a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;	Section 6
d) the date and season of the site investigation and the relevance of the season to the outcome of the assessment;	N/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
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 alternative;	Section 2,4,6
g) an identification of any areas to be avoided, including buffers;	N/A
h) a map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers;	Section 2, 5
i) a description of any assumptions made and any uncertainties or gaps in knowledge;	Section 1
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 6
k) any mitigation measures for inclusion in the Environmental Management Programme (EMPr);	Section 6
l) any conditions for inclusion in the environmental authorisation;	Section 6

m) any monitoring requirements for inclusion in the EMPr or environmental authorisation;	Section 6
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, and where applicable, the closure plan;	Section 6, 8
o) a description of any consultation process that was undertaken during the course of preparing the specialist report;	Section 4
p) a summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	Appendix A
q) any other information requested by the competent authority.	N/A
2) Where a government notice *gazetted* by the Minister provides for any protocol or minimum information requirement to be applied to a specialist report, the requirements as indicated in such notice will apply.	N/A

1 INTRODUCTION

1.1 PROJECT DESCRIPTION

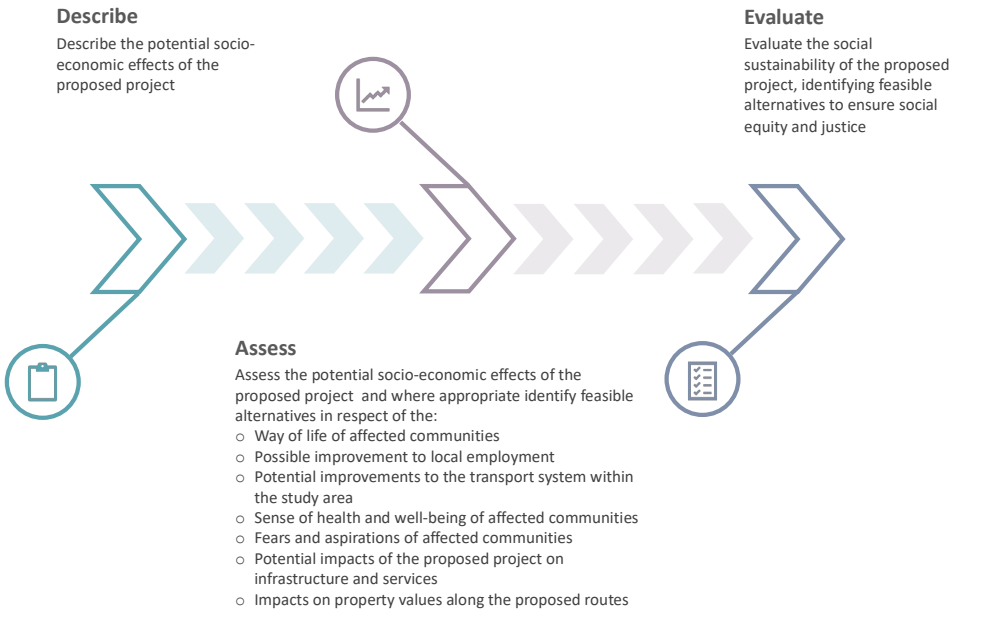
Urban-Econ Development Economist Pty (Ltd) has been appointed by SiVEST SA (Pty) Ltd's Environmental Division (hereinafter referred to as SiVEST) on behalf of K2022578692 South Africa (Pty) Ltd, The Applicant, to undertake the required Basic Assessment (BA) process for the proposed development of the 500-megawatt alternating current (MWac) solar photovoltaic (PV) facility and associated infrastructure, to be located approximately 20 kilometres (km) to the east and north-east of Beaufort West in the Western Cape Province. The project is being developed either to supply the national grid under the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) or similar procurement programme (SiVest, 2023).

The project will consist of one Environmental Authorisation (EA); one BA for the solar energy facilities (SEF) including related infrastructure. Thus, the entire project will require one EA process. The purpose of this report is to serve as an Impact Assessment for the proposed Rhino PV and Sunnyside PV Facilities, hereafter referred to as the proposed development. The proposed facility is also split in two portions, however, for the purpose of this report, it is seen as one facility with the same socio-economic impacts.

1.2 OVERALL PROJECT OBJECTIVE

An Impact Assessment aims to assess any potential socio-economic impacts, either positive or negative, that may arise as a result of a proposed development. The impacts are analysed for the construction, operational and decommissioning phases of the proposed development. Additionally, mitigation measures to reduce the severity of negative impacts and measures to optimise the positive impacts are included in the report. Figure 1-1 illustrates the project objectives of the proposed development.

Figure 1-1: Project Objective



1.3 SCOPE OF WORK

The scope of work for this assessment is in line with Government Notice No. 320 of 2020, Site Sensitivity Verification Requirements where a Specialist Assessment is required but no Specific Assessment Protocol has been Prescribed, and Appendix 6 of the 2014 Environmental Impact Assessment Regulations, as amended, (EIA Regulations), both enacted under the National Environmental Management Act, 1998 (Act 107 of 1998) as amended (NEMA).

A Site Sensitivity Verification (SSV) of the site was conducted prior to this assessment, see **Annexure A**.

The Socio-Economic Impact Assessment (SEIA) will:

- Identify and assess the socio-economic impacts associated with:
  - the construction phase;
  - operational phase; and
  - decommissioning phase;
- Provide a general overview of the baseline conditions associated with the affected community;
- Identify and assess any potential socio-economic impacts, either positive or negative, that may arise because of the proposed project of individuals, household, agricultural related activities including forestry and commercial businesses;
- Identify the economic impacts of the proposed project during construction, operational and decommissioning activities (gross value added, income generation and employment) due to the implementation of the project
- Identify mitigation measures to reduce the severity of negative impacts and measures to optimise the positive impacts identified in this report

1.4 METHODOLOGY

The following sections outline the research methods that have been employed in the study.

1.4.1 Project description and study area delineation

This step involves the description of the proposed project and delineation of the core study areas for basic social impact assessment.

1.4.2 Data collection

This step will involve collection of both primary and secondary data. The former will involve virtual and/or telephonic interviews with the local government authorities, local community representatives, and affected landowners. The latter will encompass the collection and review of relevant policies, local and provincial strategic documents, and statistics presented by Statistics South Africa (StatsSA) and Quantec.

1.4.3 Baseline profiling

This step will focus on a description of the study areas' socio-economic environment based on the data collected in the previous step. The baseline profile will be used to interpret the impacts and measure the extent of socio-economic impacts that could ensue from the establishment of the proposed development.

1.4.4 Identification and description of the anticipated impacts

This step will include the description of the potential socio-economic impacts that could be expected to ensue considering the development's components.

1.4.5 Interpretation and evaluation

Once the impacts are identified, they will be interpreted in the context of the affected environments, i.e., baseline profiles, and evaluated. The impacts and extent thereof will be assessed and categorised in line with the rating provided by the environmental specialist.

1.5 Source of Information

The following information (Table 1-1) will be sourced from various sources to inform the study:

Table 1-1: Source of Information

Source	Information
From the client:	• Start of construction • Construction methodology • Contact details of Interested and Affected Parties (I&APs) as well as surrounding landowners • Types of skills required and to be filled by people from the local communities • Small business development programme during construction phase
From the site visit/ interview:	• Socio-economic challenges experienced by the affected stakeholders • Need and desirability of the proposed developments • Concerns and issues related to the developments • Alignment with the local government vision and objectives • Other projects planned for the area
From secondary sources:	• Previously completed studies and reports • StatsSA Census 2011 and Community Survey 2016 • StatsSA Labour Force Survey • Quantec Research database • Integrated Development Plans (IDP) • Spatial Development Frameworks (SDF) • Local Municipal and Provincial strategic documents where applicable

1.6 Assumptions, Limitations and Gaps in Knowledge

- The secondary data sources used to compile the socio-economic baseline (demographics, dynamics of the economy) although not exhaustive, can be viewed as being indicative of broad trends within the study area.
- The study was done with the information available to the specialist within the time frames and budget specified.

- Possible impacts and stakeholder responses to these impacts cannot be predicted with complete accuracy, even when circumstances are similar, and these predictions are based on research and years of experience, taking the specific set of circumstances into account.
- It is assumed that the motivation, and ensuing planning and feasibility studies for the project were done with integrity and that all information provided to the specialist by the project proponent and its consultants to date is accurate.
- Landowner engagements were conducted, however the limited responses/ information received resulted in a qualitative approach regarding the impacts identified. If the client, landowner, or applicant provides further information, the report will be updated accordingly.

2 DESCRIPTION OF THE PROPOSED DEVELOPMENT

In this section a description of the proposed development is provided. The site where the proposed development will be located and the activities that will take place on and off the site will be discussed.

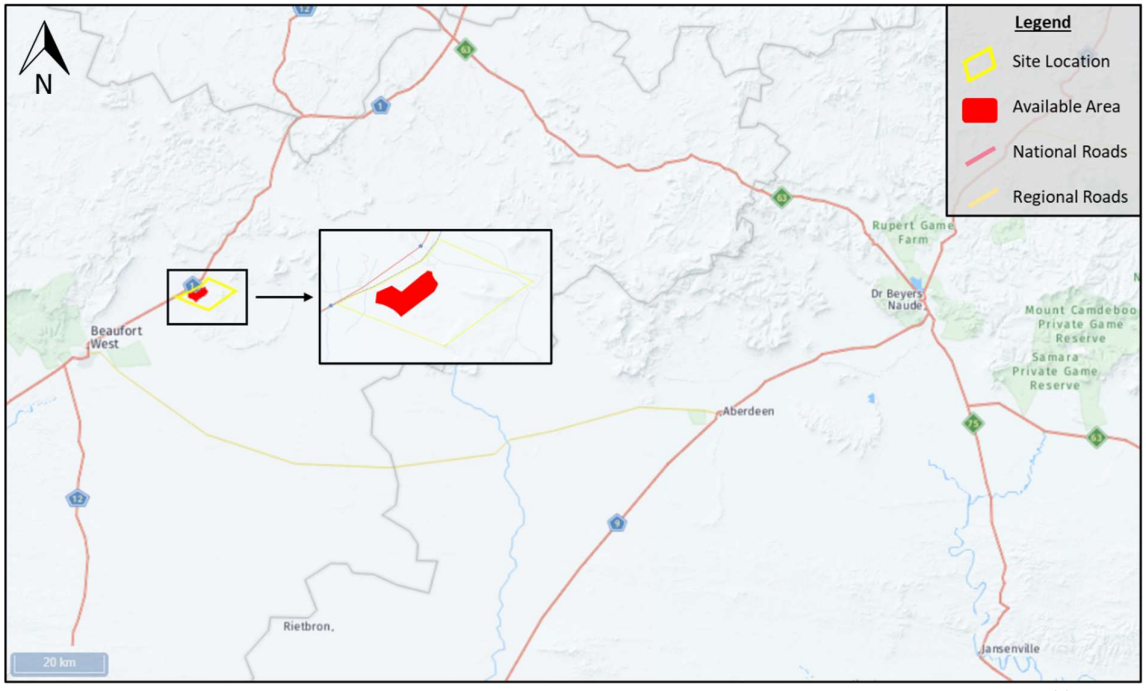
2.1 SITE LOCATION

The applicant intends to develop a SEF and associated infrastructure on the Remainder of farm Rhenosterkop 155 (Rhino PV) and Farm 400 (Sunnyside PV). These SEF make up the proposed development site. The proposed SEF is located in the Western Cape Province. The proposed SEF is situated approximately 20 km east and north-east of Beaufort West. The proposed SEF will have a maximum generating capacity of up to 500 MWac. The total development footprint of the proposed SEF is approximately 489.09 hectares (ha) (SiVest, 2023).

2.1.1 Rhino PV Facility

Map 2-1 illustrates the proposed development site from a macro perspective as well as the available area (footprint of the development) for the proposed Rhino PV site. The proposed development site stretches across 4 247 ha, whereas only 563 ha are available for development.

Map 2-1: Proposed Development Location (Rhino PV Facility)

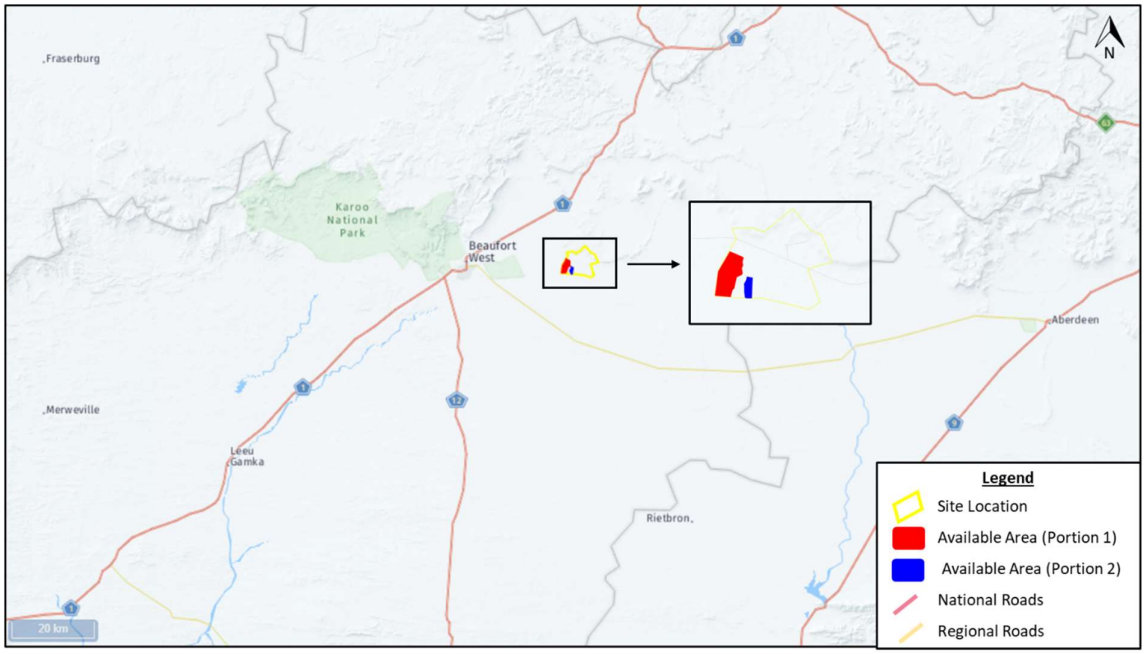


Source: MapAble, 2023

2.1.2 Sunnyside PV Facility

Map 2-12Map 2-1 illustrates the proposed development site from a macro perspective as well as the available area (footprint of the development) for the proposed Sunnyside PV site. The proposed development site stretches across 4 035 ha, whereas only 525.2 ha are available for development.

Map 2-2: Proposed Development Location Sunnyside PV Facility

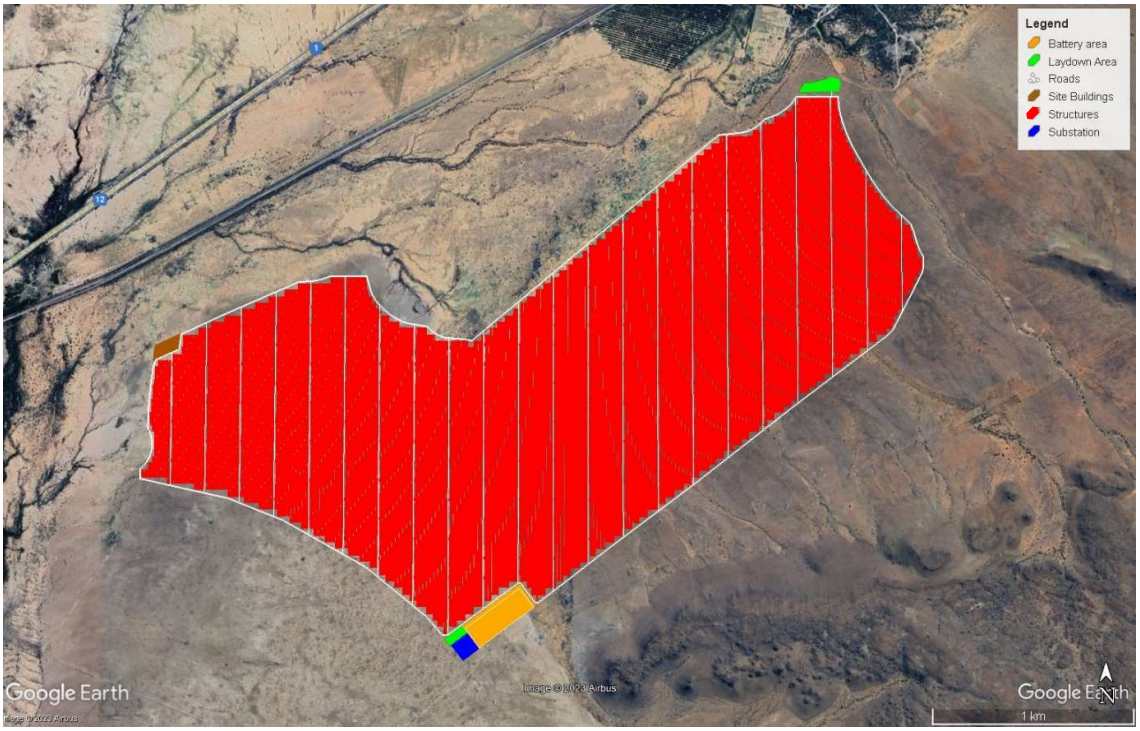


Source: MapAble, 2023

2.1.3 Rhino PV Facility Site Layout

Map 2-3 is a visual representation of the envisioned layout for the proposed development site. The site expands across a total area of 563 ha, and it is envisaged that the primary infrastructure of the facility will be established along the south-eastern boundary. However, it is important to note that certain areas within this site have been designated as restricted zones, primarily situated in the northern region, and are also located in close proximity to the substation. These restricted zones are essential for the project's safety and operational considerations and have thus been excluded from the proposed development footprint.

Map 2-3: Proposed Development Site Layout



Source: Google Earth 2023

2.1.4 Sunnyside PV Facility Site Layout

Map 2-4 is a visual representation of the envisioned layout for the proposed development site. The site expands across a total area of 525,2 ha, and it is envisaged that the primary infrastructure of the facility will be established along the south-western boundary. However, it is important to note that certain areas within this site have been designated as restricted zones, primarily situated in the centre region. These restricted zones are essential for the project's safety and operational considerations. These areas have therefore been excluded from the development footprint. As mentioned earlier, the proposed facility is also split in two portions, however, for the purpose of this report, it is seen as one facility with the same socio-economic impacts.

Map 2-4: Proposed Development Site Layout

Source: Google Earth, 2023

2.2 NEED AND DESIRABILITY

South Africa is continuously challenged with a pressing electricity supply crisis, resulting in the recurring imposition of load shedding. The repercussions of these power outages have sent shockwaves through the national economy and society at large. Moreover, the compounding factors of the COVID-19 pandemic aftershock, decreasing business confidence, and successive national credit downgrades have collectively cast a shadow over the country's economic landscape. In light of these multifaceted challenges, this section aims to underscore the imperative and attractiveness of the proposed project, aligning its relevance with the above-mentioned circumstances.

2.2.1 South African electricity supply

According to CSIR[1] (2023), as of 2022, South Africa possessed a total wholesale / public nominal capacity of 54 GW (gigawatts). The breakdown of capacity follows:

- Coal is 39,8 GW (increased)
- Nuclear is 1,9 GW (unchanged)
- Diesel (OCGT[2]) is 3,4 GW (unchanged)
- Hydro is 0,6 GW hydro and pumped storage is 2.7 GW (unchanged)
- Wind is 3,4 GW (unchanged)

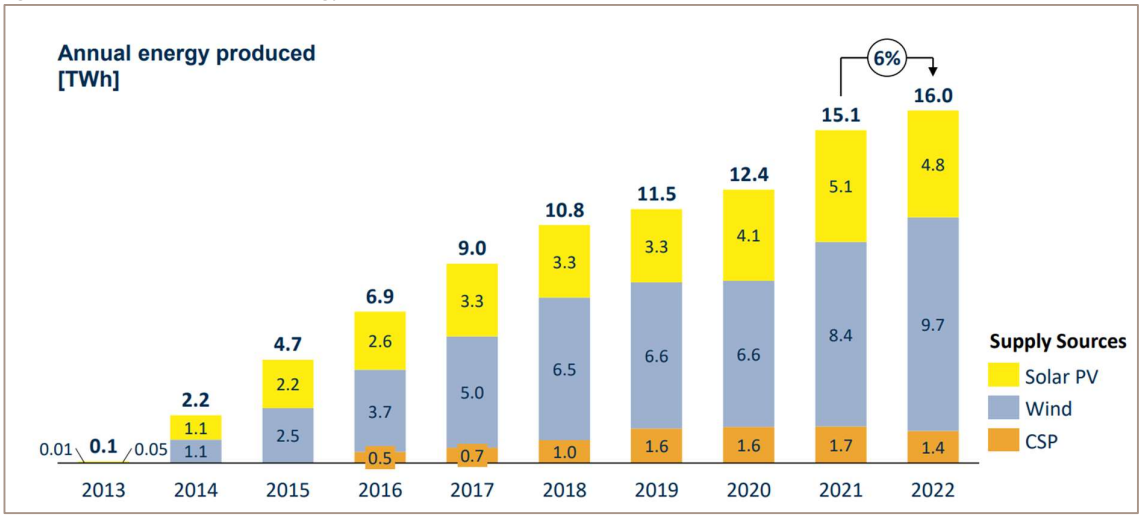
[1] Council for Scientific and Industrial Research

[2] Open cycle turbine gas

- Solar PV is 2,3 GW (increased)
- Concentrating Solar Power (CSP) is 0,5 GW (unchanged)

Coal still dominates and provides approximately 80,1% of electricity generated, high diesel usage continues, renewables (excluding hydro) accounted for 7,4%. Wind energy contributed 4,3% whereas solar PV contributed 2,1%. In 2022, there were 3 773 hours of load shedding, with a maximum capacity of 11 529 gigawatt-hours (GWh) compared to the actual energy shed, which amounted to 8 301 GWh. 2022 saw a significant occurrence of severe load shedding, primarily categorized as Stage 4, marking the first time it exceeded Stage 2. Load shedding was prevalent for approximately 43% of the total hours during the year (CSIR Energy Centre, 2023).

Figure 2-1: Annual Renewable Energy Produced



Source: (CSIR Energy Centre, 2023)

It is evident from Figure 2-1 that solar PV energy generation reduced between 2021 and 2022, however, the large increase in wind energy generation resulted in a 6% increase for the same period. Additionally, the supply of electricity in South Africa is currently exceptionally constrained. Load shedding in South Africa began in 2007 as a result of insufficient electricity generating capacity by the government-owned national power utility, Eskom Holdings SOC Limited (Eskom). The advent of load shedding has brought numerous direct economic impacts, indirect economic impacts and social impacts to South Africa. These are outlined in Table2-2 below:

Table 2-1: The consequences of power interruptions

Direct Economic Impacts	Indirect Economic Impacts	Social Impacts
Loss of business and manufacturing production	Cost of postponed income	Loss of leisure time
Restart costs	Loss of market share	Risks to health and safety
Equipment damage	Limitations to expansion and growth of production	
Raw material spoilage	Loss of competitive advantages	
Cost of backup systems	Loss of investor confidence	

Source: (Goldberg, 2015)

These costs are associated with losses to productivity and limitation of growth for companies and as a result limit the growth of the country (Goldberg, 2015). Load shedding thus threatens jobs, economic recovery, and the livelihood of many South Africans.

Local research done through government agencies has also noted the need for change in the electricity industry. The National Energy Regulator of South Africa (NERSA), (2020) has examined the electricity supply industry challenges and possible solutions for those challenges and has maintained that continued price increases for electricity is unsustainable as it reduces demand. The increase in electricity prices has led to an increase in export of un-beneficiated ore which is likely to increase as the electricity price increases (NERSA, 2020).

It has also been noted that there has been a reduction in export volumes of minerals which is likely a result of the increased price of electricity and unstable electricity supply. It has also been noted that the negative trend in exports mimic the Gross Domestic Product (GDP) growth trends, which seems to be inversely proportional to electricity prices (NERSA, 2020). NERSA has also noted that electricity price is a significant cost driver for some sectors. The increase in electricity cost has a greater impact on some sectors such as the metals, steel and mining industry and less of an impact on other industries such as the transport industry. New energy trends have also been noted by NERSA (NERSA, 2020).

Their position is that the obligation to supply the majority of domestic, commercial, and small industries energy (day load) should be removed from Eskom and be supplied by renewable energy (RE) independent power producers (IPP) sources (NERSA, 2020). It can thus be assumed, that at a national level any additional energy production which is sustainable, and renewable would improve energy security, further South Africa's goals towards international agreements, provide employment, and assist in improving investor confidence in the country.

2.2.2 Global energy outlook

In 2022, energy markets experienced volatility and unpredictability. The swift economic recovery post-COVID19, albeit less robust than in 2021, coupled with the Russian Federation's invasion of Ukraine in February, contributed to additional spikes in energy prices (REN21, 2023).

According to the Renewables Global Status Report (2023), elevated oil and gas prices contributed to an increase in the cost of energy, encompassing both traditional and renewable sources, as well as food and essential commodities throughout the year. To counteract the inflationary impact, governments implemented various policies, such as the European Union's (EU) RePowerEU initiative and the United States (US) Inflation Reduction Act, 2023 (REN21, 2023).

These initiatives incorporate significant measures aimed at promoting energy efficiency and accelerating the adoption of RE sources (REN21, 2023). Simultaneously, concerns regarding climate change were underscored by a series of extreme weather events, ranging from severe floods in Pakistan to intense heatwaves, droughts, and wildfires in China, Europe, and the US. In response to these immediate challenges, many countries opted to increase subsidies for fossil fuels and expand coal consumption, thereby perpetuating the global dominance of fossil fuels in energy production and consumption. Furthermore, the surge in prices impeded progress toward achieving universal access to modern energy services.

Following are some key statistics/ points regarding energy on a global level for the years 2021/2022 as per (REN21, 2023):

- The total final energy consumption (TFEC) rose by 1% in 2022, compared to 2021.
- In 2021, RE represented 12,6% of the TFEC.
- The global power sector emissions increased by 1,3% in 2022.
- Renewable electricity represented 30% of total electricity generation.

2.2.3 Just Energy Transition

According to International Institute for Sustainable Development (IISD), (2018), energy transitions are shifts in the way people produce and consume energy using different technologies and sources.

A low-carbon energy transition is a type of energy transition involving a shift from high-carbon energy sources such as oil, gas and coal to low-carbon and zero-carbon energy sources such as renewables (S&P Global, 2020). A just energy transition (JET) is a negotiated vision and process centred on dialogue, supported by a set of guiding principles, to shift practices in energy production and consumption.

JET aims to minimize negative impacts on workers and communities with stakes in high-carbon sectors that will wind down, and to maximize positive opportunities for new decent jobs in the low-carbon growth sectors of the future. JET strives to ensure that the costs and benefits of the transition are equitably shared. Acting sooner rather than later can make energy transitions less expensive and more equitable, while also providing new opportunities for countries to build low-carbon industries. Nonetheless, overcoming "carbon lock-in" is difficult, and targeted political and media efforts are required to speed up JETs. Much may be done to help these processes which are either underway or in the early stages in many nations. Based on case studies and research, the Table 2-3 lists concrete steps that governments can take to begin or accelerate the JET (IISD, 2018).

Table 2-2: Implementation Steps for JET

Understanding the context	• Map the political economy of an energy transition • Use detailed analyses of positive and negative impacts of an energy transition (at national, regional or even plant level)
Identifying champions	• Facilitate international and regional exchange and peer learning between countries at different stages of energy transition processes, including engagement with labour, businesses, civil society, especially for developing country contexts • Round tables at the country level to start or enhance a conversation on a just transition between all concerned stakeholders • High-level dialogue between countries in similar situations to promote the idea of a just transition at the highest levels of government (e.g., at the EU, OECD[3] or G20 level or bilaterally)

[3] Organisation for Economic Co-operation and Development

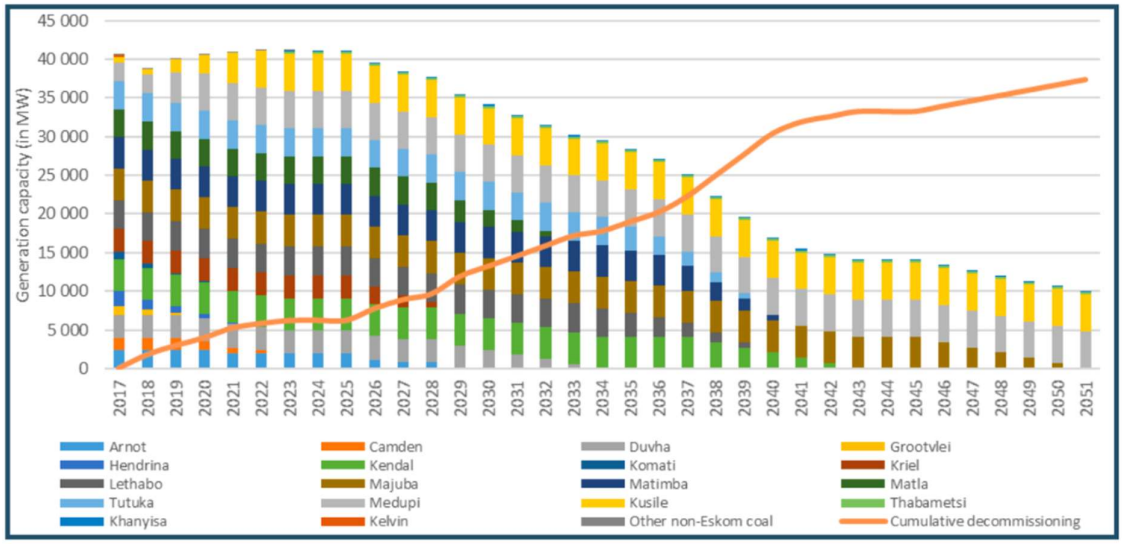
Making the case	• Develop communications strategies for JETs • Set up inclusive processes for "two-way communications" • Train government officials in communications
Implementing just transition measures	• Promote localized green jobs, including in decentralized energy and energy efficiency, and link this explicitly to the energy transition • Mobilize additional funding to promote visible and tangible just transition measures, and communicate about the benefits • Share best practices of just transition measures

Source: (International Institute for Sustainable Development, 2018)

According to Trade & Industry Policy Strategies (TIPS) (2021), South Africa's just transition plan is both essential and conspicuously absent as the reality of a coal transition and coal power decommissioning approaches.

The need to manage the transition's effects on employees and local economic development, particularly in coal-dependent regions and communities, is urgent. It is necessary to have a credible fact base from which to make suitable and widely supported decisions. Several specific political consensuses must be brokered in this conceptual clearing in order to enable policy creation and execution, as well as investment, for a green and just transition. Illustrated within Figure 2-2, is South Africa's scheduled decommissioning rollout plan between 2017 and 2051.

Figure 2-2: South Africa's coal-based generation capacity and scheduled decommissioning



Source: (Trade & Industry Policy Strategies, 2021)

According to the Just Energy Transition Implementation Plan (JET IP) (2022), the coal plant decommissioning will need R4,1 billion between 2023 and 2027. Coal plant-decommissioning costs reflect what Eskom has currently provided for in its planning. These costs exclude the costs of repurposing or repowering retired plants and other infrastructure investments.

As per the JET IP (2022), the infrastructure investment priorities are:

- To manage the decommissioning of the retiring coal generation fleet, in line with a revised Integrated Resource Plan (IRP), and in tandem with the development of RE generation at scale and pace
- To timeously strengthen the transmission grid infrastructure to accommodate the shift to RE
- To modernise the electricity distribution system

2.2.4 National sub-investment downgrades

During 2022, Moody's Investor Service surprised market expectations by improving South Africa's credit rating status, shifting it from negative to stable (Loos, 2022). This upgrade came as a surprise, as there has been an anticipated downgrade. Before the credit rating upgrade, Moody's had assigned South Africa a "junk status" (News24, 2022). One of the known impacts of the downgrade was that South Africa fell out of the World Government Bond Index (WGBI) and other popular bond indexes, an index that measures the performance of fixed-rate, local currency, investment-grade sovereign bonds (Richardson & Singh, 2020).

The sub-investment rating means that South Africa has dropped out of some of the widely used global bond indexes and forced international funds which track these indexes to sell South African bonds. It is estimated that between $22-$28 billion in capital has already flowed out of local markets since 2018 with the recent downgrade account for between $1,5 and $8 billion (Duvenage, 2020). South Africa remains excluded from the WGBI since its initial removal. Despite the passage of time, South Africa has not yet been reinstated into this global financial index.

The absence of South Africa from the WGBI has significant implications for its international financial standing, as it restricts the country's access to a vital platform that influences investment decisions and market perceptions worldwide. The reasons behind this exclusion and the efforts, if any, to regain membership remain a topic of interest and concern within the global financial community.

Trading Economics assigned South Africa a credit rating of 41, ranking it fourth in Africa, under countries such as Botswana, Mauritius, and Morocco. South Africa's rating is comparable to that of Namibia and Ivory Coast (Trading Economics, 2023). At the start of 2023, South Africa saw its credit rating outlook shift from positive to stable, according to S&P Global, 2023, a prominent financial information provider. This adjustment was primarily attributed to the persistent issue of load shedding that plagued most of 2023. This downgrade occurred despite signs of economic recovery observed in the middle of 2022 (Wasserman, 2023).

In Fitch’s credit rating evaluation, Fitch has linked South Africa's diminished GDP, load shedding and infrastructure failures, to its low credit rating. It's worth noting that Fitch has classified South Africa's credit rating as "stable," which aligns with the rating assigned by S&P Global (BusinessTech, 2023). South Africa's credit rating, as assessed by Fitch, Moody's, S&P Global, and DBRS, currently falls within the uppermost category of Speculative Grade, which is the level below Investment Grade. This indicates that there has been some progress after the previous downgrades, but South Africa's credit rating still carries higher risk compared to investment-grade nations (World Government Bonds, 2023). The country’s overall rating is currently stable, indicating a neutral position in terms of its economic and financial outlook.

In terms of direct impacts on the construction of the proposed project, is that of currency fluctuations. With an unstable local currency, there may be unexpected and unplanned costs involved when importing technology for the project. The development and utilisation of local supply chains could go a long way in minimising the risks associated with currency fluctuations.

2.2.5 Assessment of business confidence levels in South Africa

The South African Chamber of Commerce and Industry (SACCI) Business Confidence Index (BCI) increased by 1,1 index points from an average of 108,5 index points in 2021 to 109,6 index points in 2022. However, the business confidence gained strong momentum towards the end of 2022 with the BCI improving from an average of 108.6 in the 1st half of 2022 to 110.7 in the 2nd half of 2022.This was followed by an increase in BCI to 112.9 in January 2023 (SACCI, 2023).

In the period between December 2022 and January 2023, eight out of the fourteen sub-indices comprising the BCI exerted a favourable influence on it when analysed on a month-to-month basis. Notable among these contributing sub-indices were heightened levels of merchandise imports, an increase in tourist arrivals, improved real retail sales, particularly during the Black Friday period, and a rise in stock prices. These specific indicators played a significant role in driving up the BCI in January 2023 (SACCI, 2023).

Conversely, the energy supply situation, including incidents of electricity blackouts, had an immediate and substantial adverse impact on business confidence in January 2023. However, there was some relief in the form of lower fuel costs, although they remained relatively high, with a 23% increase compared to the previous year. The delayed repercussions of electricity load shedding are a source of significant concern for other sectors of the economy and overall business confidence (SACCI, 2023).

The following indicators should be taken into consideration when analysing the business environment as they negatively contributed to the BCI:

- Energy Supply
- Exports
- Retail Sales
- Inflation
- Real financing cost
- Rand exchange rate

The further development of RE would likely lead to improved supply of electricity for the development of the economy. This is likely to improve business confidence in the country as sustainable energy supply is one of the key concerns of business moving forward. International investors have also noted, with concern, that the lack of availability of a consistent energy system does not lend itself to growth of Foreign Direct Investment (FDI) (Santander, 2020). The development of RE systems is seen by local and foreign business owners as the future of energy generation and may increase business confidence both locally and internationally (Kovaleski, 2019).

2.2.6 Agricultural price increases

Fuel and diesel are commonly used for tillage, harvesting, machinery and transportation, making them a critical component for both small-scale and commercial farmers, as well as the entire agricultural value chain (Maree, 2019). According to van Wyk (2018) the ongoing increase in fuel costs is adversely affecting the agricultural industry. Diesel has become the second highest expenditure for grain farmers, following fertilizer. In a nation where maize is a crucial food source, the surge in diesel prices will also impact poor communities.

As reported by Farmers Weekly, diesel prices surged by R8,29 per litre (R/l) from November 2021 to November 2022. This increase in diesel costs is noteworthy, especially considering that on average, diesel accounts for approximately 14% of a farmer's overall production expenses (Marais, 2022). Currently, diesel costs R23,06/l, marking a R1,78 decrease since its peak prices witnessed in 2022 (News24, 2023). According to the Agriculture Portal, in 2021, grain farmers had an average diesel expenditure of R1 031 per ha. However, this cost escalated to R1 529 per ha by the end of 2022 (Farming Portal, 2022).

Increasing expenses in inputs, including elevated costs of fuel, labour, fertilizers, energy, and agrochemicals, are putting pressure on producers in the field crops and horticulture sectors. There have been calls for intervention to address this issue. In the case of direct input products like glyphosate, atrazine, and metolachlor, their prices rose by 99%, 33%, and 32% respectively in 2021. This upward trend also applies to major fertilizers such as ammonium nitrate, urea, and potassium chloride, which saw price increases of 107%, 58%, and 125% respectively. (Sihlobo & Kapuya, 2021).

These increases in input costs continuously put pressure on farmers on a daily basis. It is worth mentioning that the proposed development could help diversify the landowner’s income, potentially helping to counter these escalating costs.

2.2.7 Synopsis

Solar RE holds paramount significance in South Africa due to its potential to assist the nation's energy challenges, promote sustainability, and foster economic growth. South Africa, blessed with abundant sunlight throughout the year, can harness solar energy to diversify its energy mix, reduce dependency on fossil fuels, and mitigate the adverse environmental impacts associated with traditional energy sources. Embracing solar power helps in combating climate change by significantly lowering carbon emissions, thus contributing to global efforts in environmental conservation.

Furthermore, the adoption of solar energy technologies creates employment opportunities, stimulates local industries, and attracts investments in the renewable sector, thereby bolstering the country's economy. Solar power not only offers a solution to the energy deficit in remote and off-grid areas but also enhances energy access and reliability for communities, industries, and businesses nationwide. By investing in solar RE, South Africa not only ensures a sustainable energy future but also promotes social well-being, economic stability, and environmental stewardship for generations to come.

3 POLICY REVIEW AND PROJECT ALIGNMENT

In this section, an analysis of the essential laws and regulations related to the planned development is conducted. This includes a comprehensive review of significant national, provincial, and local policies that directly impact the development.

3.1 POLICY AND PLANNING ENVIRONMENT

The overall aim of this review process is to provide insight into the government's priorities and plans in terms of renewable energies. This assists in determining the relevance of the project with regard to the development objectives of the various spheres of government as well as in identifying potential developmental conflicts that the project might create. A brief review of the most relevant documents is provided in Table 3-1.

Table 3-1: Brief Overview of relevant policies

Policy	Key Policy Objectives	Source
National Policy: South Africa		
National Development Plan (NDP), 2030	• Creating jobs and livelihoods • Expanding infrastructure • Transitioning to a low-carbon economy • Transforming urban and rural spaces • Improving education and training • Providing quality health care • Building a capable state • Transforming society and uniting the nation • Fighting corruption and enhancing accountability	(NPC, 2012)
New Growth Path Framework (NGPF), 2011	• Infrastructure investment • Main economic sectors as employment sectors • Seizing the potential of new economies • Investing in social capital and public services • Fostering rural development and regional integration	(South African Government, 2011)
Renewable Energy Vision (REV), 2030 South Africa	• RE as an exceptional source of flexible supply within the context of uncertain energy demand • Comprehensive RE base will support a resilient South African future • A sustainable energy mix that excludes undue risks for the environment of society	(World Wildlife Fund, 2014)
The Constitution of the Republic of	• "Everyone has the right to an environment that is not harmful to their health or well-being" (Section 24)	(Republic of South Africa, 1996)

Policy	Key Policy Objectives	Source

South Africa, 1996 (Act 108 of 1996) as amended	• The environment should be protected for the benefit of present and future generations, through reasonable legislative and other measures that:
	  ○ Prevent pollution and ecological degradation
	  ○ Promote conservation
	  ○ Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development	

White Paper on Energy Policy of the Republic of South Africa, 1998	• Seeks to ensure that an equitable level of national resources is invested in renewable technologies, given their potential and compared to investments in other energy supply options • Aims to create energy security by diversifying the energy supply and energy carriers	(Department of Minerals and Energy, 1998)
White Paper on the Renewable Energy Policy of RSA, 2003	• Pledges government support for the development, demonstration and implementation of RE sources for both small and large-scale applications	(Department of Minerals and Energy, 2003)
South African Renewable Energy Masterplan (SAREM)	• One of the goals of the SAREM is to boost the economy by developing new RE projects by 2030 • Another of the aims of the SAREM is to intervene and create a programme to rollout solar generating units for schools, clinics and hospitals (among others)	(Mineral Resources & Energy Science and Innovation Trade, Industry and Competition, 2023)
Just Energy Transition Investment Plan (JET IP), 2023 - 2027	• To meet Nationally Determined Contribution targets, the JET IP has a goal to speed up reasonably priced and diversely owned RE systems. • In accordance with the energy policy Eskom intends to stop using seven coal plants.	(The Presidency of The Republic of South Africa, 2023)
Industrial Policy Action Plan, 2018/19-2020/21	• As a part of the radical economic transformation plan, the policy aims to transition from carbon emitting energy sources to renewable energy sources. • The policy identifies that the government sees renewable energy generation as a key for industrial development. • To motivate independent renewable power, the SA government has implemented the REIPPP (Renewable Energy Independent Power Producers Programme).	(Department of Trade and Industry, 2018)

Policy	Key Policy Objectives	Source
National Framework for Sustainable Development (NFSD), 2008	• The framework outlines that funds have been allocated to the university sector to benefit the development of alternative energy solutions. • Eskom has initiated the South African Bulk Renewable Energy Generation (SABRE-Gen) initiative aimed at fostering the growth of fresh energy ventures, which include solar facilities.	(The Department of Environment and Tourism, 2008)
REIPP, 2022	• An objective of this programme is to enhance electricity generation in South Africa through IPPs. • To broaden the nation's energy sources and reduce the reliance on diesel and coal, promoting greater diversity in the energy mix.	(TownPlanner.co.za, 2023)
National Infrastructure Plan, 2012	• Aims to facilitate socio-economic development, is the "greening" of electricity generation. • One of the Strategic Integrated Projects aims to provide support for green energy initiatives.	(Presidential Infrastructure Coordinating Commission, 2012)
The Risk Mitigation Independent Power Producer Procurement Programme (RMIPPPP) in Context	• This programme identifies the shortfall of electricity production. This objective is identified in the IRP, 2019. • Another objective of the programme is to move away from diesel generators. • To be able to call on IPP's to generate additional electricity in case of production shortfalls that lead to load shedding.	(Department: Mineral Resources and Energy, n.d.)
Provincial Policy: Western Cape		

Western Cape Provincial Spatial Development Framework (SDF), 2014	• The SDF advocates for the promotion of the transition to RE sources.
	• As part of the Resource Management Policy, there is an emphasis on restricting the utilization of scarce resources.
	• Under the POLICY R4: recycle and recover waste, deliver clean sources of energy to urban consumers, shift from private to public transport, and adapt to and mitigate against climate change:
	  ○ To promote air quality, it is suggested to make use of RE sources.
	  ○ To benefit the energy sectors, diverse energy generating sources should be pursued.
		(Western Cape Government, 2014)

Policy	Key Policy Objectives	Source
Western Cape Green Economy Strategy Framework, 2013	• The Western Cape Government's Green Economic Strategic Framework aims to grow the RE sector, by injecting capital into Power Purchase Agreements (PPAs). • One of the objectives outlined in the framework is to establish a policy framework that prioritizes the development of green infrastructure. • An objective is to cultivate RE sources with the aim of achieving a 42% contribution to the total new generated power by the year 2030. • The GreenCape initiative was rolled out in 2010 to assist the national RE development. • A specific action item for the Western Cape Government entails actively pursuing prospective opportunities for the development of RE generation projects. • To cultivate a specialized workforce in the field of green energy, a dedicated training centre has been established at the Cape Peninsula University of Technology.	(Western Cape Government, 2013)
Western Cape Strategic Plan for 2020-2025	• A goal is identified to enforce viable energy solutions. • This plan also refers to the National Environmental Management Air Quality Act, 2004 (Act 39 of 2004) as amended (NEMAQA), which has a goal to drive down air pollution. • Section 24 of the Constitution of the Republic of South Africa states that every person has the right to an environment that does not cause harm to their health. In the plan, an aim to achieve this human right, is to prevent air pollution and the pollution of the environment. • This plan outlines the objective to move towards a low carbon emitting economy.	(Western Cape Government, 2020)
District & Local Municipal Policy: Central Karoo District Municipality & Beaufort West Local Municipality		
Central Karoo District Municipal SDF, 2019	• The SDF identifies opportunities to develop solar and wind power generating plants in the Central Karoo. • The SDF refers to Policy A5: Support and Promote the Renewable Energy Economy, which states to identify and promote green energy projects that can be developed in the area. The Policy states that incentives should be in place to boost green energy projects.	(Western Cape Government, 2019)

Policy	Key Policy Objectives	Source
Central Karoo District Municipality Integrated Development Plan (IDP), 2017 – 2022	• A solution to relieve pressure on the biodiversity, is to use energy generated by renewable sources. • The IDP refers to the Air Quality Management Plan under Environmental Protection. • The Air Quality Management Plan has a goal to reduce greenhouse gas emission and assist with the reserving of resources.	(Central Karoo District Municipality, 2017)
Karoo Readiness Action Plan, 2021	• The plan identifies the need to include green energy projects in SDF's and IDP's. • The plan outlines the need to increase air quality, by implementing more RE projects, in order to reduce the reliance on coal generated electricity. • One of the actions of the plan is to improve air quality compliance, as well as to create by-laws to control air quality.	(Hardcastle, 2021)
Beaufort West Municipality IDP, 2022/2027	• The IDP identifies the national goal to create new RE projects that produce a total of 24.4 GW. • Air pollution is identified as a municipal function. • Section 15(2) of the NEMAQA, refers to the aim to reduce greenhouse gas emission, which is identified in the plan.	(Beaufort West Municipality, 2022)

3.2 SYNOPSIS

The review of the policy environment suggests that utilisation, application and investment in RE sources in South Africa is considered to be an integral means of reducing the carbon footprint of the country, diversifying the national economy, reducing poverty and creating much-needed additional sources of energy. Any project contributing to the above-mentioned objectives can therefore be considered strategically important to South Africa.

From a provincial and municipal policy perspective the facilitation of RE projects and interventions that relate to the broader green economy are seen as a priority in terms of the policies and strategies developed.

4 SOCIO-ECONOMIC PROFILE OF THE STUDY AREA

This section documents various aspects of the study area (Western Cape Province, Central Karoo District Municipality and Beaufort West Local Municipality) including population and household numbers, income levels and employment. In addition, the section also reviews the economic structure and performance of the study area. The intention of this review is to provide an overview of the socio-economic context of the area so as to better understand the dynamics of the area to inform the project.

4.1 POPULATION, INCOME AND EMPLOYMENT PROFILE

The Central Karoo District Municipality encompasses three local municipalities, each contributing differently to its overall composition. Within the Central Karoo District Municipality, Beaufort West Municipality constitutes 70,83% of the total population and 69,77% of the households (Quantec Standardised Regional, 2023; Stats SA, 2011 forecast to 2023).

Table 4-1 is an overview of the study area's population, income and employment profiles. Population growth between 2012 and 2022 was 0,45% year-on-year for the local municipality, which was lower than the district municipality (0,58%), however, both realised a lower growth rate compared to the Western Cape (1,93%) (Quantec Standardised Regional, 2023; Stats SA, 2011 forecast to 2023). The population's growth rate serves as a key indicator of increasing opportunities within the local municipality (Quantec Standardised Regional, 2023; Stats SA, 2011 forecast to 2023). Furthermore, the population density of 2,45 individuals per square kilometre (km^2) signifies adequate space to accommodate a larger population in the local municipality (Quantec Standardised Regional, 2023; Stats SA, 2011 forecast to 2023). The average household income in the local municipality compares close to the district, at an average of R11 360, which is slightly lower than the district's average of R11 518 and significantly lower than the provincial average of R20 266 (Quantec Standardised Regional, 2023; Stats SA, 2011 forecast to 2023).

Table 4-1: Overview of the primary study areas population structure

Indicator	Western Cape	Central Karoo District Municipality	Beaufort West Local Municipality
Area (km^2)	129 462	38 854	21 917
Population	7 181 757	75 934	53 781
Number of Households	1 989 790	20 058	13 994
Population density (/km^2)	55,47	1,95	2,45
Average household size	3,60	3,77	3,83
Annual population growth (2012-2022)	1,93%	0,58%	0,45%
Average monthly household income	**R20 266**	**R11 518**	**R11 360**

Source: (Quantec Standardised Regional, 2023; Stats SA, 2011 forecast to 2023)

The proposed development is poised to draw in a surge of residents to the study area, primarily owing to the numerous employment opportunities that will be generated as a direct result of the project. The creation of multiple job opportunities serves as a compelling magnet, enticing individuals to relocate and settle within the vicinity of the project.

This influx of population is expected to be a natural consequence of the employment prospects that the project brings, thereby contributing significantly to the demographic landscape of the area. As these employment opportunities take place, the local community is likely to witness an influx of new residents, thereby fostering both social and economic growth within the region. ***Error! Not a valid bookmark self-reference.*** provides data on the employed and economically inactive individuals, the percentage of the population without employment, and the rate of labour force participation within the study areas. The slightly higher unemployment rate and lower labour force participation relative to the Central Karoo District Municipality and the Western Cape further suggests that the Beaufort West Local Municipality is subject to outward migration due to low employment opportunities available within the local municipality.

Table 4-2: Employment profile of the study areas

Indicator	Western Cape	Central Karoo District Municipality	Beaufort West Local Municipality
Employed	2 473 329	18 389	11 869
Unemployment Rate	24,49%	25,59%	28,07%
Not Economically Active	1 773 248	22 165	16 516
Labour force participation rate	64,88%	52,72%	49,98%

4.2 ECONOMIC PROFILE

The following subsection outlines the economic profile at a provincial, district and local municipal level. After contracting by 1,1% towards the final quarter of 2022, the South Africa's GDP rallied in the first quarter of 2023, expanding by 0,4% (Stats SA, 2023).

4.2.1 Regional economic profile

Indicated in Table 4-3 is the Gross Value Added (GVA) contribution in 2015 constant prices for the study area. The GVA of the local municipality was valued at R4,5 billion in 2022 (constant prices), which accounts for around 68,09% of the district economy's GVA, and 0,34% of the GVA of Western Cape. The proposed development will contribute further to the economy and ensure sustainability.

Table 4-3: Economic structure between 2012 and 2022 (constant 2015 prices; R' millions)

Sector	Western Cape		Central Karoo District Municipality		Beaufort West Local Municipality	
	2012	2022	2012	2022	2012	2022
Agriculture and hunting	4,72%	5,35%	20,42%	23,44%	16,11%	19,20%
Mining and quarrying	0,34%	0,26%	0,06%	0,05%	0,08%	0,07%
Manufacturing	27,02%	22,77%	4,96%	4,25%	5,88%	5,08%
Electricity, gas and water	2,18%	1,89%	4,45%	4,31%	4,20%	3,91%
Construction	7,00%	4,65%	7,43%	4,59%	6,37%	3,63%
Trade	11,78%	11,79%	12,91%	11,17%	12,97%	11,41%
Transport and communication	10,65%	13,74%	14,35%	15,76%	16,51%	17,84%
Finance and business services	22,50%	25,42%	9,64%	10,42%	11,65%	12,72%
Community services	6,78%	7,43%	11,49%	12,07%	11,67%	11,98%
General government	7,03%	6,69%	14,29%	13,94%	14,56%	14,17%
TOTAL GVA	**R1 167 285**	**R1 321 146**	**R5 647**	**R6 624**	**R3 985**	**R4 510**

Source: (Quantec Standardised Regional, 2023)

The growth in the local municipality over the last few years was largely due to the strong performance of the agricultural, finance and transport sectors. The manufacturing, construction and utilities sectors both indicated a smaller contribution in 2022, than in 2012. Even though trade sector indicated a noticeable contraction in the last 10-years in the local municipality, the sector remains a large contributor in the economy. The agricultural sector in the local municipality is the sector that expanded the most. The predominant agricultural pursuit in the region is sheep farming, primarily yielding wool and meat production. Nevertheless, the area also witnessed extensive farming of goats and cattle (Hoffmann, 2020). The growth of lamb production exhibited a substantial increase of 97% over the period from 2011 to 2021. This notable increase serves as a significant indicator of the lamb sector's substantial contributions to the growth of the agricultural sector (Department of Agriculture, Land Reform and Rural Development, 2021).

The proposed project would have an impact on the reliability and generation of electricity, which will further contribute to the utilities sector within the local municipality, which currently only contributes 3,91% towards the municipality's economy.

Table 4-4: GVA per sector for the Beaufort West Local Municipality (2015 constant prices; in R' millions)

Sector	Beaufort West Local Municipality		
	2012	2022	CAGR
Agriculture and hunting	641,99	865,82	3,04%
Mining and quarrying	3,17	3,22	0,18%
Manufacturing	234,28	228,95	-0,23%
Electricity, gas and water	167,41	176,34	0,52%
Construction	253,70	163,84	-4,28%
Trade	516,91	514,62	-0,04%
Transport and communication	658,16	804,37	2,03%
Finance and business services	464,31	573,73	2,14%
Community services	464,95	540,26	1,51%
General government	580,42	638,90	0,96%
TOTAL GVA	**R3 985,30**	**R4 510,04**	**1,24%**

Source: Quantec Standardised Regional (2023)

The sector with the biggest Compound Annual Growth Rate (CAGR) between 2012 and 2022, was the agricultural sector, with 3,04%. Over the last ten years, the CAGR of the local municipality increased marginally with 1,24%, which is kept growing because of the agricultural, transport and finance including business sectors indicating strong CAGRs. The manufacturing and construction sectors realised a contraction between 2012 and 2022, where the proposed project will aid with improving business activity within these sectors (Quantec Standardised Regional, 2023).

As evident by Table 4-5 the community services sector makes a large contribution towards employment on all levels from provincial to local. The mining and quarrying sector contributed the least to employment in the Beaufort West Local Municipality. The utilities sector, being the second-lowest contributor, serves as an indicator of the necessity to boost job prospects within the industry through the proposed development. Beaufort West Local Municipality's construction sector, which accounted for only 3,39% and utilities sector only 0,53% in 2022, is expected to see improvements due to the recommendation of employing local labour for the construction of the proposed project.

Table 4-5: Employment structure and contribution between 2012 and 2022 per economic sector

Sector	Western Cape		Central Karoo District Municipality		Beaufort West Local Municipality	
	2012	2022	2012	2022	2012	2022
Agriculture and hunting	10,17%	10,30%	22,51%	24,99%	16,90%	20,04%
Mining and quarrying	0,08%	0,06%	0,01%	0,01%	0,02%	0,02%
Manufacturing	11,02%	9,94%	1,81%	1,55%	2,23%	2,00%
Electricity, gas, and water	0,35%	0,35%	0,54%	0,59%	0,52%	0,53%

Construction	6,19%	5,48%	4,99%	4,08%	4,50%	3,39%
Trade	22,44%	23,11%	23,51%	21,47%	25,46%	23,73%
Transport and communication	4,48%	4,06%	5,05%	3,87%	5,98%	4,53%
Finance and business services	18,34%	20,14%	8,83%	8,76%	10,78%	10,47%
Community services	20,51%	19,83%	23,34%	23,76%	23,84%	23,82%
General government	6,42%	6,72%	9,41%	10,93%	9,78%	11,48%
TOTAL EMPLOYMENT	**2 246 258**	**2 426 605**	**17 370**	**18 282**	**11 809**	**11 816**

Source: Quantec Standardised Regional (2023)

Western Cape Province, Central Karoo District Municipality and Beaufort West Local Municipality rely on the agricultural sector for employment opportunities. Agricultural activities require significant labour input, so even a slight reduction in the sector's size can result in more job losses compared to capital-intensive industries like manufacturing or utilities. Moreover, the agricultural sector often serves as a major source of employment in rural areas. These factors underscore the sector's importance and why it is usually prioritized in development strategies.

4.3 SYNOPSIS

The local municipality has a comparatively small population and fewer households in comparison to other areas within the province. The average household income in this municipality is R11 360, significantly lower than the provincial average of R20 266. Despite its modest size, the municipality boasts a diverse economy, with agriculture being the primary contributor, followed by the transport and communication sectors. Employment opportunities are primarily driven by the community services sector, with trade also playing a significant role.

In an effort to address its economic challenges and create more jobs, the municipality is actively seeking new projects and developments, such as the proposed initiative. These initiatives are crucial to stimulating economic growth, increasing employment opportunities, and bridging the income gap between the municipality and the province. By investing in these projects, the local community aims to boost its economy, improve living standards, and create a more sustainable future for its residents.

5 THE AREA OF INFLUENCE

5.1 INTRODUCTION

In this section a description of the area that will be impacted on is provided. The geographic area (referred to hereafter as the Area of Impact/Influence - AOI) for which the socio-economic baseline is developed assumes that the people, communities and businesses immediately surrounding the projects are likely to experience the greatest socio-economic impacts as a result of the construction, operational and decommissioning phases of the proposed project.

The socio-economic AOI is determined based on the following:

- Assessment of the area of impact based on the construction activities on the sites.
- The nature of the activities such as the operation of heavy machines and equipment described in the preceding section, heavy vehicles and trucks moving to and from the site.
- Distances of communities and people living from the site and areas where the activities including the transport activities will take place.
- The likely impact of air quality, visual and noise generated on the site and along the transport routes. Note that separate air, noise and visual specialist reports are prepared that deal with these impacts in more detail.

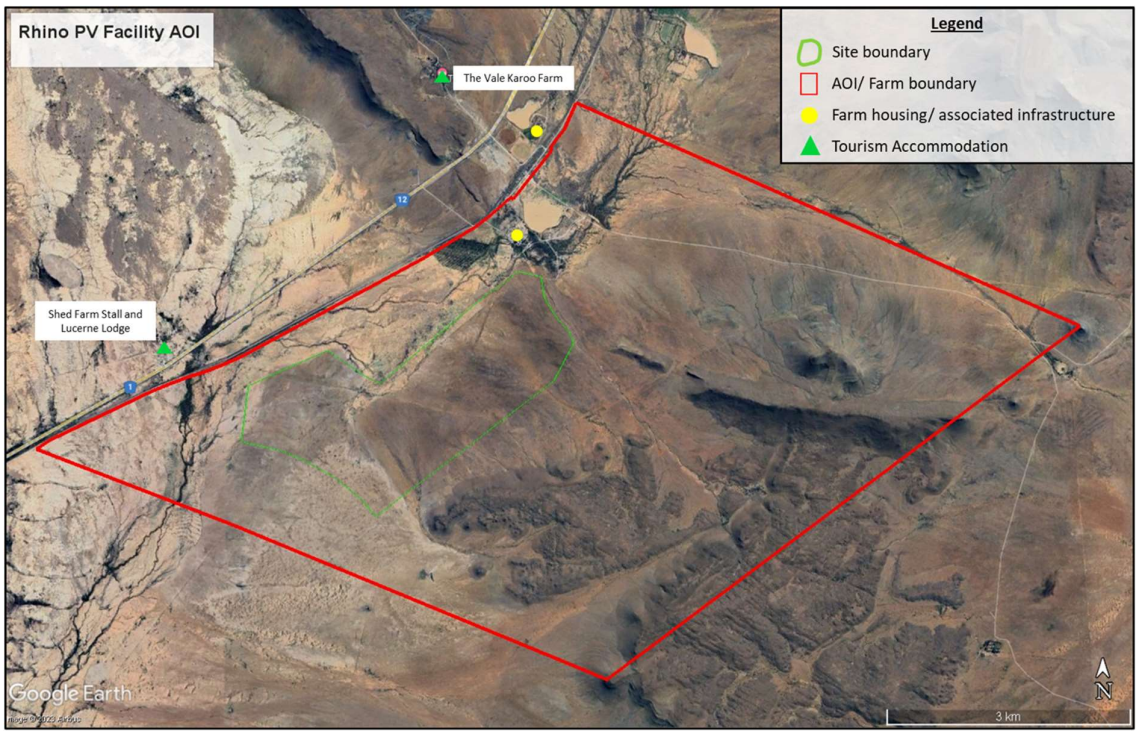
5.2 DIRECT AREA OF INFLUENCE

5.2.1 Rhino PV Facility

In the provided Map 5-1, the project's immediate socio-economic impact zone, the AOI, is outlined in red. During this phase of the project, the direct AOI includes the entire project site as well as the roadways that offer access to and from the site. Consequently, any socio-economic changes, developments, or influences stemming directly from the project are concentrated within this specific area. Grasping the scope of the direct AOI is essential for evaluating the project's localized impact, facilitating well-informed decisions about its planning, management, and overall consequences on the surrounding community and infrastructure.

Within the defined AOI, agricultural grazing stands as the primary land use. Towards the northern region lies a pivotal water source, a dam, surrounded by agricultural residential housing and vital agricultural infrastructure, all enveloped within the AOI boundaries. Just outside this area, two additional agricultural households and their corresponding infrastructure contribute to the agricultural landscape. The national road, N1/N12, not only provides access to the proposed facility but also integrates seamlessly into the AOI, as it will be utilized by construction vehicles. The Vale Karoo Farm offers a variety of accommodation facilities, as well as wedding and conference facilities, on a working Dorper sheep stud farm. The Shed Farm Stall and Lucerne Lodge offers a variety of accommodation facilities, as well as a farm stall and onsite butchery. The above identification, is based on the immediate area, however, depending on the visual sensitivity of the proposed development and associated infrastructure, the area in which tourism facilities were identified would need to be broadened (Urban-Econ Development Economists, 2023).

Map 5-1: AOI and Zone of Influence Rhino PV Facility



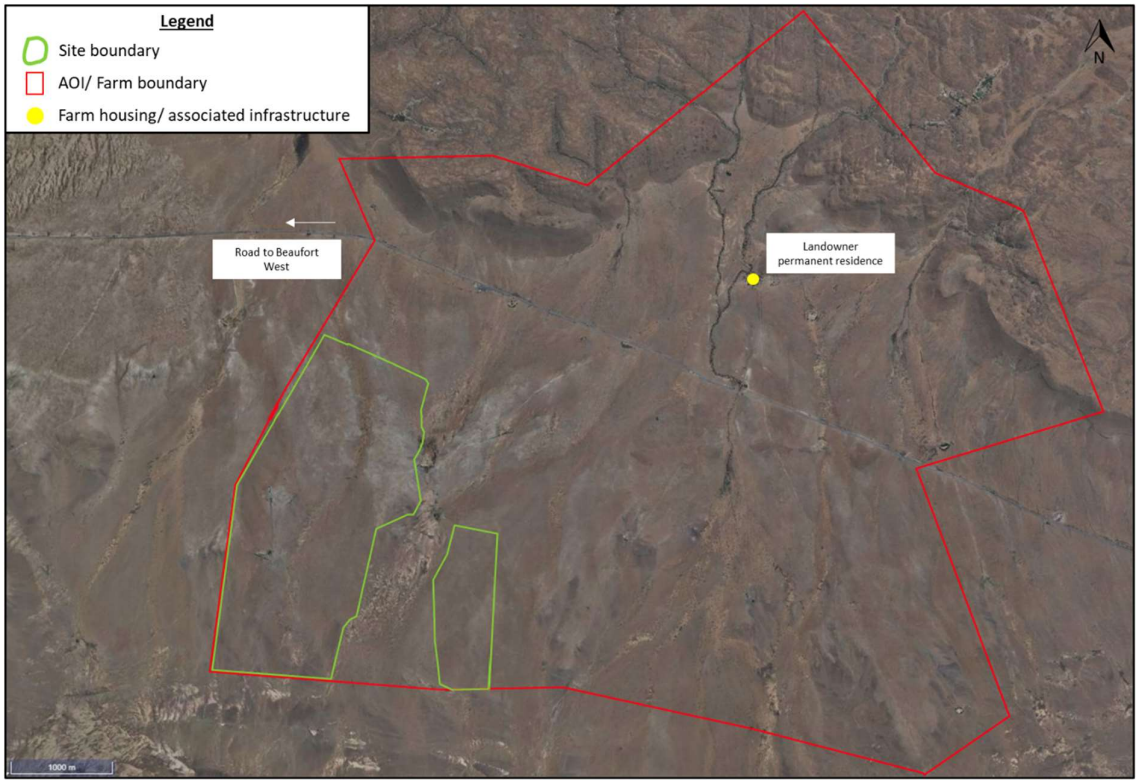
Source: Google Earth, 2023

5.2.2 Sunnyside PV Facility

In the provided Map 5-2, the project's immediate socio-economic impact zone, often referred to as the AOI is clearly demarcated by the red area. In phase of the project, the direct AOI encompasses the entire project site along with the roadways providing access to and from the site. This means that any socio-economic changes, developments, or influences resulting directly from the project are concentrated within this defined area. Understanding the direct AOI is crucial in assessing the project's localized impact and aids in making informed decisions regarding its planning, management, and overall implications on the surrounding community and infrastructure.

In the AOI, agricultural grazing emerges as the predominant land use. Extending towards the northern sector of this area are the landowner's residences and agricultural infrastructures, all contained within the boundaries of the AOI. Moreover, the road connecting to Beaufort West to the west intersects the property's centre, thus becoming an integral component of the AOI.

Map 5-2: AOI and Zone of Influence Sunnyside PV Facility



Source: MapAble, 2023

6 IMPACT ANALYSIS

6.1 INTRODUCTION

The Interorganizational Committee on Guidelines and Principles for Social Impact Assessment (1998) defines social impacts as:

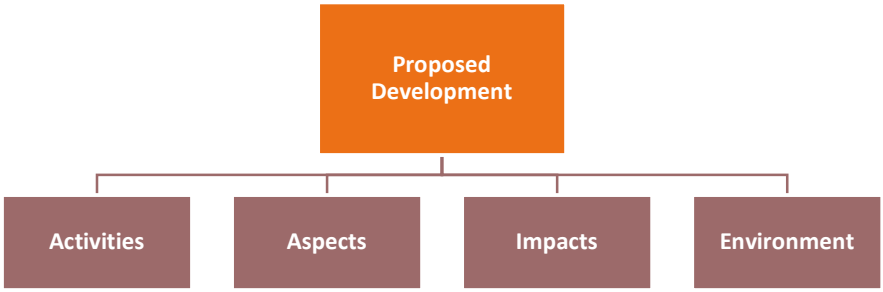
> *"The consequences to human populations of any public or private actions that alter the ways in which people live, work, play, relate to one another, organise to meet their needs and generally cope as members of society. The term includes cultural impacts involving changes to the norms, values and beliefs that guide and rationalize their cognition of themselves and their society."*

6.2 SOCIAL AND SOCIO-ECONOMIC IMPACTS

Impact Assessments are instruments intended to identify and where possible quantify both economic and socio-economic impacts. Typically, socio-economic impacts are assessed from the perspective of the specific local people, households, community, business and other land-uses in the environment.

The process of identifying potential impacts is illustrated in Figure 6-1.

Figure 6-1: Process of Identifying Potential Impacts



6.3 ECONOMIC IMPACTS

Typically, economic impacts are assessed from the perspective of the national and regional economy within which the proposed development is to be implemented. Economic impacts can be defined as the effects (positive or negative) on the level of economic activity in a given area(s). The net economic impact is usually measured as the expansion or contraction of an area's economy, resulting from the changes in i.e., opening, closing, expansion or contraction of a facility, project or programme.

All new projects have two basic types of investments, an initial capital injection / expenditure which can take the form of either a greenfield development (i.e., new construction project on vacant land) or brownfield development (i.e., a modification of an existing structure and there is an annual investment made to maintain/ operate the investment).

The economic impacts created by a capital injection are once-off impacts that will occur for the duration of construction. Thus, economic impacts associated with the construction phase are not sustainable economic impacts. Hence the temporal nature of capital expenditure and long-term nature of operational expenditure impacts cannot be added together to determine the total economic impact. The net economic impact of an exogenous change in the economy will be translated according to various direct and indirect economic effects, as outlined below:

Direct economic impacts: The changes in local business activity as a direct consequence of public or private activity in the economy. Furthermore, increased user benefits lead to monetary benefits for some users and non-users within the geographical area:

- For affected residents, benefits may include reduced costs for obtaining goods and services, increased income from selling goods and services to outsiders, and/or increased variety of work and recreational opportunities associated with greater location accessibility. For affected businesses, there may be economic efficiency benefits in terms of product cost, product quality or product availability, stemming from changes in labour market access, cost of obtaining production inputs and/or cost of supplying finished products to customers.

Indirect and induced impacts: The direct benefits to business and the residents of communities and regions may also have broader indirect / induced impacts:

- Indirect – Growth of municipal revenues due to raised taxes and service levies.
- Induced – Business growth as the additional workers (created by direct and indirect economic impacts / effects) spend their income on food, clothing, shelter and other local goods and services.

Economic impacts refer to the impact that the construction, operational and maintenance phases of the proposed development will have on the economy, as measured by the following economic indicators:

- **Contribution to Regional GDP:** Regional GDP is a broader measure of the full income effect. This measure reflects the sum of wage income and corporate profit generated in the study area due to an exogenous change in the regional economy.
- **Employment Creation:** The employment resulting from the construction, operation and maintenance of the project under investigation. The skill level of employment created is also considered.
- **Production / Business Sales:** The value of all inter- and intra-sectoral business sales generated in the economy because of the introduction of an exogenous change in the economy. Explained more simply, new business sales equate to additional business turnover as a result of the introduction of an exogenous change in the economy (e.g., the construction of a powerline and substation).
- **Personal Income:** Refers to the salaries and wages earned as a result of the employment generated from the development of the proposed project.

6.4 IMPACT ASSESSMENT

The following sub-section will determine the impacts that the proposed development will have.

6.4.1 Construction Phase Impacts

The following sub-sections indicate the impacts that are likely to occur during the construction phase of the proposed development. Since the facility are expected to have both positive and negative effects in terms of the same indicator, the evaluation of impacts has been grouped accordingly.

6.4.1.1 Positive impacts during construction

a) Temporary stimulation of the national and local economy (GDP and Production)

The establishment of a solar PV facility holds significant promise for supporting economic production and GDP during its construction phase. Firstly, the construction process itself generates a substantial demand for labour, creating employment opportunities within the local community. Additional employment opportunities will result in increased household incomes, thereby stimulating consumer spending and fostering economic growth. Secondly, the procurement of raw materials, equipment, and services necessary for the construction phase stimulates various sectors of the economy such as manufacturing, transportation, and logistics. This increased economic activity surges into increased tax revenues for local governments, which can be reinvested into public infrastructure and services. Moreover, the development of a solar PV facility demonstrates a commitment to RE, attracting investments and fostering innovation in the energy sector. These factors, combined, create a positive economic multiplier effect, propelling economic production and contributing significantly to the national GDP during the construction phase of the solar PV facility.

b) Temporary increase employment in the national and local economies

If a substantial portion of the local workforce is sourced from the local municipality, it could significantly alleviate the issue of local unemployment, particularly considering the region's unemployment rate surpasses the provincial average. Apart from the immediate job opportunities generated directly by the development during the construction phase, there will be positive spill-over effects on employment across various sectors of both national and local economies. By procuring goods locally, stimulating consumption, the project will indirectly bolster employment in sectors such as construction, business services, and trade.

In addition, expenditure outside the local area will also create temporary employment opportunities. The project's production and consumption impacts are expected to generate induced positions, with a considerable portion of these employment opportunities emerging through backward linkages[4]. It is strongly advised that during the construction phase, the developer actively encourages the Engineering, Procurement, and Construction (EPC) contractor to prioritize hiring local labour from within the local municipality, and then neighbouring municipalities. This will foster economic growth within the community and support a sustainable workforce.

4 It contributes to allowing the emergence of other new industries. Backward linkage refers to the fact that the product of the newly emerging industry induces demand for materials and enables the emergence of supply industries.

c) Contribution to skills development in the country and local economy

The construction of the proposed development is poised to positively impact skills development in South Africa. During the manufacturing and assembly phase, integrated within the construction period and planned for the Western Cape, the involvement of foreign technical experts presents a unique opportunity for knowledge and skills transfer to local manufacturers. As the construction staff gain valuable insights and expertise in solar energy facility development, the likelihood of having a more skilled local workforce emerges. This not only enhances the country's skills landscape but also has the potential to reduce the costs associated with future solar projects in the province. Moreover, the development's direct effects on skills development and the local economy could enhance the growth of the region's research and development (R&D) and manufacturing sectors related to solar technology.

d) Temporary increase in household earnings

The establishment of a solar PV facility is likely to increase household earnings, particularly during the construction phase. This economic upswing can be attributed to various factors inherent to large-scale RE projects. The construction phase generates a multitude of employment opportunities ranging from skilled labourers to engineers and technicians, providing steady income streams for local households. The influx of workers and increased economic activity stimulates local businesses, such as restaurants, accommodations, and service providers, leading to a boost in sales and job opportunities within these sectors. Moreover, the demand for raw materials and supplies necessary for construction strengthens trade and commerce within the region benefiting local suppliers and entrepreneurs. This economic synergy amplifies household earnings directly through employment, and indirectly by fostering a vibrant local economy. Thus, enhancing the overall financial well-being of the community.

e) Temporary increase in government revenue

Investing in the facility will yield revenue for the government throughout the construction phase, derived from various sources such as personal income tax, value added tax (VAT), companies' tax, and corporate income tax. Determining the exact corporate income tax value is challenging at this stage due to the unknown gross operating surplus of the EPC contractor responsible for constructing the facility. These earnings will be allocated by the national government to support public expenditure for essential areas like transport infrastructure, healthcare, education, and other public goods and services.

6.4.1.2 Potential negative impacts during construction

a) Negative changes to the sense of place

The construction of a solar PV facility, while promising sustainable energy solutions, may adversely impact the sense of place during the construction phase. The installation process often involves significant disruption to the local environment, including increased noise levels, heavy traffic from construction vehicles, and alterations in the landscape. These disruptions can impair the tranquillity of the area, disturb the local wildlife, and temporarily obscure scenic views, all of which are integral to the unique sense of place that characterizes the area. Additionally, construction activities might lead to dust and debris, affecting air quality and visual aesthetics. These changes can cause distress among the local community, eroding the familiar and cherished ambiance of the area, thus reducing the overall sense of place during the construction period. If the necessary mitigation

measures are followed, this impact can be kept at a low significance, however, the visual impact specialist will be determining the overall significance of this impact.

The tourism facilities and farm housing / agricultural infrastructure within the Rhino PV facility area, as seen in **Error! Reference source not found.**, might be affected the most by the proposed development. According to SiVEST (2023), the proposed development on Farm 400 needed to be located to the southwest of the property so that it is not visible from the farmstead. A layout was then developed and discussed with the landowner which was agreed upon (Map 5-2). Presented with the proposed development area, the landowner noted their support of the development, and that development would be within an area that is not preferred by sheep for grazing evident by the sheep always migrate back to their preferred areas.

b) Safety and Security

Implementing a solar PV facility during the construction phase could pose significant challenges to safety and security. The installation of solar panels often involves intricate electrical work and the handling of heavy equipment, creating an environment ripe for accidents and injuries if not managed meticulously. Construction sites are inherently hazardous, and the introduction of delicate solar panels adds an extra layer of complexity, increasing the risk of on-site incidents. Furthermore, the valuable nature of solar equipment makes these sites attractive targets for theft and vandalism, posing security threats. Managing the construction of a solar PV facility demands heightened vigilance, specialized training, and stringent security protocols to ensure the safety of workers and protect against potential theft or damage, thus contributing negatively to overall safety and security during the construction phase.

c) Agricultural Operations

It is important to note that this impact is based on satellite imagery and general knowledge of the study area due to limited information received during landowner engagements. The introduction of a solar PV facility during its construction phase could potentially cast a negative impact on the existing agricultural operations, predominantly centered around sheep farming. Construction activities often lead to disturbances in the natural environment, causing noise pollution, soil erosion, and disruption of grazing areas. Heavy machinery, excavation work, and transportation of construction materials can disturb the tranquillity of the area, causing stress to the sheep and hindering their grazing patterns. Dust and debris generated during construction may contaminate pastures, affecting the quality of forage available to the sheep. Additionally, the alteration of land for solar panel installation might result in the reduction of grazing space, limiting the sheep's access to essential food resources. These disruptions could lead to a decline in the health and well-being of the sheep that may impact the overall agricultural operations negatively during the construction phase of the solar PV facilities.

As indicated earlier, the landowner confirmed that the grazing area will not be impacted by the proposed development (Sunnyside PV Facility).

d) Impacts on economic and social infrastructure

The proposed development will create several employment opportunities (South African based positions) for the duration of the project. Given that these workers will require services there is likely to be an increase in the demand for social services, access to water and electricity.

Given the proximity of the development site to Beaufort West, it is most likely that the health facilities in the area will experience additional demand for medical services brought about by the influx of job seekers. These connections will, however, be minimal and unlikely to alter the demand significantly. The effects of the project on road infrastructure should also be considered as it is highly likely that the development will lead to an increase in traffic volumes on surrounding roads.

The deterioration of the roads could place additional financial burden on the municipality through additional maintenance costs. Additional traffic volumes are also likely to impact the condition of secondary roads used to access surrounding farms. Based on the above discussion it is expected that the basic service provision, health facilities and road infrastructure will be under additional strain during the construction period. Given that the project is anticipated to attract additional people to the area, the significance of the impact is considered to be low. These impacts can however be mitigated if the developer engages with the local municipalities and plans accordingly.

6.4.2 Operation Phase Impacts

The following sub-section describes the impact that the proposed development will have once it is operational. The facility is envisaged to have a long lifespan (minimum of 35 years), which means that the impacts observed during this phase, regardless of whether the impacts are positive or negative, will be long-lasting.

6.4.2.1 Positive impacts during operations

a) Sustainable increase in production and GDP nationally and locally

The multiplier effects resulting from the production and consumption of the project are relatively limited compared to traditional electricity-generating industries. This disparity arises from the fact that the solar energy facility utilizes a free energy source for electricity production - unlike conventional power stations that incur substantial operating costs due to raw inputs like coal and transportation. This cost advantage renders the solar facility an exceptionally appealing business venture. Apart from the positive effects on production and GDP stemming from operational expenses, the local economy is expected to receive a boost through the developer's planned socio-economic contributions in the immediate area. Although the contribution to the local municipality may be modest concerning the overall size of the municipality's economy, it remains positive and, crucially, sustainable.

b) Creation of sustainable employment positions nationally and locally

The establishment of solar PV facility promises significant positive contributions to employment during their operational phase. As the facilities become fully operational, a wide array of job opportunities spanning various skill sets emerges, including roles in maintenance, operations, quality control, and technical support. Skilled technicians and engineers are essential for the installation and ongoing maintenance of solar panels, while administrative positions are necessary for managing day-to-day operations. Furthermore, the demand for local

labour intensifies in related sectors such as transportation and construction for necessary infrastructural developments. Moreover, the growth of the solar industry stimulates economic activities, fostering a supportive ecosystem of employment, ranging from suppliers of raw materials to service providers.

This multifaceted job creation not only bolsters the local economy but also fosters skill development and community well-being, making the solar PV facility a valuable asset in terms of employment opportunities.

c) Improved standards of living for benefiting households

Considering the average household size in the impacted local municipality, and across the nation, the rise in household earnings will benefit multiple individuals. The consistent income generated from the project's operation will enhance the living standards of the households receiving these benefits. This effect is especially significant for the local municipality, as the average income per employee at the facility is expected to surpass the average household income in these areas.

d) Sustainable increase in national and local government revenue

The proposed development is set to enhance both local and national government revenue through property taxes and salaries including wages payments. Locally, the project will financially support the local government by covering expenses related to utilities essential for its operation, and boost revenue by increasing property taxes beyond the current levels. This increase is especially vital for the local municipality, given its relatively modest economy; any additional income would significantly benefit the municipality. Nationally, the revenue generated by the project during its operational phase, coupled with the salaries and wages paid to permanent employees, will contribute to the national treasury. While the exact allocation of this revenue cannot be pinpointed, any additional income generated enables national governments to augment their expenditure on public goods and services, thereby enhancing overall societal well-being.

e) Sustainable rental revenue for farms where the SEF is located

It is anticipated that farms where the solar panels are located on will enter into a rental agreement with the developer. The owners will likely thus receive rental revenue as a result of hosting the infrastructure on their property. The revenue that the owners of the properties receive will have a positive impact on the local economies especially if spent in the local area. This revenue is also likely to assist local property owners in dealing with economic shocks to their current business activities such as drought or unfavourable economic conditions that currently prevail. The revenue generated from the rental of land for the panels will additionally assist farmers in investing in new technologies to improve the efficiencies of their current agricultural practices and allow farmers to better compete in the open market. While these impacts are notably only for those farms who have panels located on their properties, the impact of additional revenue is likely to be significant to those impacted.

f) Sustainable increase in electricity available for the local region and South Africa

The establishment of the SEFs is likely to provide a sustainable boost to the country's electricity supply. As outlined in Section 2, the deficiency in electricity and the resulting load shedding have notably affected the nation's economy, deterring foreign investment. With a more reliable power supply to support industrial operations, the overall economy is expected to witness an uplift. It is important to acknowledge that while the

proposed Rhino PV and Sunnyside PV facilities may not single-handedly resolve the country's electricity shortages, the combined effect of all the proposed RE projects in the nation will collectively yield a significant and meaningful impact.

6.4.2.2 Potential negative impacts during operations

a) Negative changes to the sense of place

During its operational phase, a solar PV facility could adversely impact the sense of place in several ways. Firstly, the installation of large solar panels and associated industrial infrastructure can alter the visual landscape significantly by disrupting the natural aesthetics of the area. This change might lead to a loss of local identity, especially in regions characterized by scenic beauty or historical significance. Secondly, the operational phase often involves constant mechanical noise and intermittent noise from maintenance activities, which can intrude upon the peace and quiet of the surrounding environment. The tourism facilities and farm housing / agricultural infrastructure in proximity to the Rhino PV facility might be affected the most by the proposed development in comparison to the landowner's housing at Farm 400. However, as mentioned earlier, the landowner of farm 400 indicated that the proposed development will not be visible from their house.

The proposed solar PV facilities will result in the loss of some natural habitats and biodiversity, reducing the area's ecological uniqueness. These transformations collectively erode the harmonious relationship between the community and their environment, thus negatively impacting the overall sense of place. If the necessary mitigation measures are followed, this impact can be kept at a low significance.

The visual assessment report will discuss the development impact on sense of place in more detail and determine the overall significance of this impact.

b) Negative impact on agricultural operations

It is important to note that this impact is based on satellite imagery and general knowledge of the study area, due to limited information received during landowner engagements.

The establishment of a SEF in proximity to agricultural operations, particularly sheep farming, could potentially have adverse effects on the farming activities. One significant concern lies in the land usage itself; the large space occupied by solar panels reduces the available grazing areas for sheep. This limitation in grazing land could lead to a shortage of food, affecting the nutritional needs of the sheep. Additionally, the installation process and ongoing maintenance activities might cause disruptions, leading to stress among the animals. Changes in temperature and shading patterns might also impact the sheep's behaviour and overall well-being, potentially leading to a decline in agricultural productivity for the farmers involved in sheep farming operations.

The impact on agricultural operations on Farm Rhenosterkop 155 compared to Farm 400 Sunnyside are slightly different, however, not significant. The landowner of Farm Rhenosterkop 155 indicated that the proposed development (Rhino PV Facility) will not have an impact on their business financially. The landowner of Farm 400 Sunnyside confirmed that the grazing area will not be impacted by the proposed development (Sunnyside

PV Facility) as the proposed development footprint area is outside of the sheep's preferred grazing areas.

6.4.3 Decommissioning Phase Impacts

Upon the expiry of the SEF's lifespan, the facility would need to be decommissioned, although the facility would likely be upgraded in order to maintain and prolong the lifespan of the facility. If the facility is decommissioned, the land will be rehabilitated in order to return it to pre-project conditions. This also means that all impacts whether positive or negative, which take place during the operation phase will cease to exist. At the same time spending on the decommissioning of the components and rehabilitation of land will increase the demand for construction services and other industries. This will stimulate economic activity in the local area, albeit over a temporary period. Socio-economic impacts stimulated during the decommissioning phase are expected to be similar to those that took place during the construction phase. However, people who were permanently employed at the facility during the operational phase will lose their jobs during the decommissioning phase. The other impact to take note of is the waste management of the solar panels. Effective waste management is crucial to minimise environmental impact, ensuring proper disposal of hazardous materials, and promote sustainable practices in the RE industry.

6.4.4 No-go alternative impacts

The "no go" alternative entails choosing not to implement with the proposed development. In this scenario, the current project site status quo and ongoing activities would persist. Opting for this alternative means there will be no alterations to the existing environmental baseline, and the local economy and affected communities will not experience any benefits. The "no go" alternative carries the opportunity cost of unrealised socio-economic benefits for the local community. Given the anticipation that the positive effects and impacts of an expanded energy system will outweigh the negative effects, the preference is for the construction of the proposed development over the "no go" alternative.

6.5 Social and Economic Impacts Assessment Results

This sub-section presents the analysis of the socio-economic impacts that are expected to ensue as a result of the development of the proposed project and an evaluation of these impacts according to the predefined criteria. The potential socio-economic impacts identified arise as a consequence of construction, operation, and closure of the proposed development.

The assessment methodology is included in Annexure A of this report.

6.5.1 Impacts Ensued During Construction

Table 6-1 is the construction phase impacts imposed by the proposed Rhino PV Facility.

Table 6-1: Construction Phase Impacts For the Rhino PV Facility

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION								
		E	P	R	L	D	I / M	TOTAL	(+ OR -)	S		E	P	R	L	D	I / M	TOTAL	(+ OR -)	S
Construction Phase																				
Increase in production	Expenditure associated with the construction of the proposed development will impact the production of the local economy.	3	4	3	1	1	4	48	+	High	» The project developer should use locally sourced products where feasible in order to maximize the benefit to the local economy. » Sub-contracting of local construction companies is encouraged as far as possible for the construction of facilities.	3	4	3	2	1	4	52	+	High
Increase on GDP	Temporary increase in country's GDP due to capital expenditure during the construction period	3	4	3	1	1	4	48	+	High	»The project developer is to use locally sourced inputs where feasible in order to maximize the benefit to the economy.	3	4	3	2	1	4	52	+	High
Increase in Employment	The construction of the proposed development will positively impact the community and beyond by creating a number of job opportunities (albeit temporary).	3	4	2	1	1	4	44	+	High	» Organise local community meetings by appointing a Community Liaison Officer (CLO) to advise the local labour on the project that is planned to be established and the jobs that can potentially be applied for.	3	4	3	1	1	4	48	+	High

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION								
		E	P	R	L	D	I / M	TOTAL	(+ OR -)	S		E	P	R	L	D	I / M	TOTAL	(+ OR -)	S
											» Where feasible, effort must be made to employ locally in order to create maximum benefit for the communities.									
Skills development	Employees will develop and enhance skills thereby increasing experience and knowledge.	3	4	2	1	3	3	39	+	Medium	» In order to maximise the positive impact, it is suggested that the project company provide training courses for employees where feasible to ensure that employees gain as much as possible from the work experience. » Facilitate the transfer of knowledge between experienced employees and the staff. » Perform a skills audit to determine the potential skills that could be sourced in the area.	3	4	2	2	3	3	42	+	Medium
Increase in household earnings	Employed individuals will increase the income of their respective households and thereby experience an improvement in their standard of living.	3	4	3	1	1	4	48	+	High	» Local employment will benefit local households and the local area.	3	4	4	1	1	4	52	+	High
Increase in government revenue	The investment in the facility will generate revenue for the government during the construction period	2	4	3	2	2	3	39	+	Medium	**N/A**	2	4	3	2	2	3	39	+	Medium

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION								
		E	P	R	L	D	I / M	TOTAL	(+ OR -)	S		E	P	R	L	D	I / M	TOTAL	(+ OR -)	S
	through a combination of personal income tax, VAT, companies' tax etc.																			
Sense of place	Negative impact on sense of place (noise, dust and visual) for farmers where construction activities will take place	1	4	3	3	1	3	36	-	Medium	» Install screens around the construction site to reduce the visual impact of construction on surrounding properties » Site watering (or use of appropriate dust suppressant) from time to time to reduce dust emitting from the construction site » Also refer to visual specialist report for mitigation measures.	1	4	3	2	1	3	33	-	Medium
Safety and Security	Farmers might feel that the increase of accessibility will increase theft in the area	1	3	3	3	1	3	33	-	Medium	» Ensure proper 24/7 security is patrolling the construction sites, as well as controlled access	1	2	3	3	1	2	20	-	Low
Impact on agricultural operations	Loss of agricultural space	1	3	2	2	1	4	36	-	Medium	» Construct the solar panels and associated infrastructure on parts where the least arable land will be affected	1	3	3	3	1	3	33	-	Medium
Impacts on economic and social infrastructure	An increase in traffic due to construction vehicles and heavy vehicles could create short-term disruptions and safety hazards for current road users.	3	3	2	2	1	3	33	-	Medium	» It is encouraged that the contractor (and/or subcontractors) to provide transportation for workers to and from the site to reduce potential congestion in proximity to the site » Transportation contractors must adhere to the road rules and regulations	3	3	2	2	1	2	22	-	Low

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION								
		E	P	R	L	D	I / M	TOTAL	(+ OR -)	S		E	P	R	L	D	I / M	TOTAL	(+ OR -)	S
											» Utilise only designated access routes and entrance/ exits from the site » Implement appropriate signage and road safety measures at entrance/ exit to the site and on site									
No-go alternative impact	If the decision is made not to proceed with the proposed project, there will be no resulting impact from a socio-economic perspective.																			

Table 6-2 describes the Environmental Management Programme (EMPr) for the construction phase of the proposed Rhino PV Facility.

Table 6-2: Input To The EMPr – Construction Phase For the Rhino PV Facility

Impact	Mitigation	Responsibility	Methodology	Mitigation Objectives and time periods	Frequency
Expenditure associated with the construction of the proposed development will impact the production of the local economy.	» The project developer should use locally sourced inputs where feasible in order to maximize the benefit to the local economy. » Sub-contracting of local construction companies to occur as far as possible for the construction of facilities.	Contracts manager	Create database of local businesses and employees to engage with	During the construction phase	Once off
Temporary increase in country's GDP due to capital expenditure during the construction period	» The project developer is to use locally sourced inputs where feasible in order to maximize the benefit to the economy.	Contracts manager	Create database of local businesses and employees to engage with	During the construction phase	Once off
The construction of the proposed development will positively impact the community and beyond by creating a number of job opportunities (albeit temporary).	» Organise local community meetings, where feasible, to advise the local labour on the project that is planned to be established and the jobs that can potentially be applied for. » Where feasible, effort must be made to employ locally in order to create maximum benefit for the communities.	Contracts manager	Create database of local businesses and employees to engage with	Before construction commence	Before each construction phase
Employees will develop and enhance skills thereby increasing experience and knowledge.	» In order to maximise the positive impact, it is suggested that the project company provide training courses for employees where feasible to ensure that employees gain as much as possible from the work experience.	The person that will be in charge of employment and workers contracts.	Set up apprenticeship programmes to build onto existing skill levels or develop new skills amongst construction workers, especially those from local communities	During the construction phase	Monthly

Impact	Mitigation	Responsibility	Methodology	Mitigation Objectives and time periods	Frequency
	» Facilitate the transfer of knowledge between experienced employees and the staff. »Perform a skills audit to determine the potential skills that could be sourced in the area.				
Employed individuals will increase the income of their respective households and thereby experience an improvement in their standard of living.	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
The investment in the facility will generate revenue for the government during the construction period through a combination of personal income tax, VAT, companies' tax etc.	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
Negative impact on sense of place (noise, dust and visual) for farmers where construction activities will take place	» Ensure proper health and safety plans in place during the construction period to ensure safety on and around site during construction » Install screens around the construction site to reduce the visual impact of construction on surrounding properties » Site watering (or use of appropriate dust suppressant) from when required to reduce dust emitting from the construction site.	Visual and noise specialists	The mitigation measures proposed by the visual and noise specialists should be adhered to	Throughout to construction phase	Daily

Impact	Mitigation	Responsibility	Methodology	Mitigation Objectives and time periods	Frequency
	» Also refer to visual specialist report for mitigation measures.				
Farmers might feel that the increase of accessibility will increase theft in the area	» Ensure proper 24/7 security is patrolling the construction sites, as well as controlled access	Safety and Security Officer	Farmer should agree on access routes for contractors during construction phase, and strict adherence to no-go areas by workers with a penalty imposed if no-go areas are not adhered to	Throughout to construction phase	Daily
Loss of agricultural space	» Construct the solar panels on parts where the least arable land will be affected	Agricultural specialist	The mitigation measures proposed by the agricultural specialist should be adhere to	During the project planning phase	Once off
An impact on the demographics of the area as a result of in-migration in response to job opportunities will occur.	» Where feasible, effort must be made to employ local labour from within the local municipality in order to create maximum benefit for the communities and limit in-migration. Should additional workers be required, employment should be sought from neighbouring municipalities, as far as possible. » Train unemployed local community members with insufficient skills and increase absorption of local labour thereby decreasing in-migration.	Human Resource	Set up a recruitment office in the nearby towns and adhere to strict labour recruitment practices that would reduce the desire of potential job seekers to loiter around the properties in the hope of finding temporary employment. Establish a management forum comprising key stakeholders to monitor and identify potential problems that may arise due to the influx of job seekers to the area. Appoint a Community Liaison Officer to manage those seeking employment and engagement with the community.	Before construction commence	Monthly
An increase in traffic due to construction vehicles and heavy vehicles could create short-term disruptions and safety hazards for current road users.	» It is encouraged that the contractor (and/or subcontractors) to provide transportation for workers to and from the site to reduce potential congestion in proximity to the site » Transportation contractors must adhere to the road rules and regulations	Traffic engineer, together with local municipalities and road authorities	Adhere to the mitigations of the traffic engineer and relevant road authorities	Throughout to construction phase	Daily

Impact	Mitigation	Responsibility	Methodology	Mitigation Objectives and time periods	Frequency
	» Utilise only designated access routes and entrance/ exits from the site » Implement appropriate signage and road safety measures at entrance/ exit to the site and on site				

Table 6-3 is the construction phase impacts imposed by the proposed Sunnyside PV Facility.

Table 6-3: Construction Phase Impacts For the Sunnyside PV Facility

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION								
		E	P	R	L	D	I / M	TOTAL	(+ OR -)	S		E	P	R	L	D	I / M	TOTAL	(+ OR -)	S
Construction Phase																				
Increase in production	Expenditure associated with the construction of the proposed development will impact the production of the local economy.	3	4	3	1	1	4	48	+	High	» The project developer should use locally sourced inputs where feasible in order to maximize the benefit to the local economy. » Sub-contracting of local construction companies to occur as far as possible for the construction of facilities.	3	4	3	2	1	4	52	+	High
Increase on GDP	Temporary increase in country's GDP due to capital expenditure during the construction period	3	4	3	1	1	4	48	+	High	»The project developer is to use locally sourced inputs where feasible in order to maximize the benefit to the economy.	3	4	3	2	1	4	52	+	High
Increase in Employment	The construction of the proposed development will positively impact the community and beyond by creating a number of job opportunities (albeit temporary).	3	4	2	1	1	4	44	+	High	» Organise local community meetings by appointing a Community Liaison Officer (CLO) to advise the local labour on the project that is planned to be established and the jobs that can potentially be applied for. » Where feasible, effort must be made to employ locally in order to create maximum benefit for the communities.	3	4	3	1	1	4	48	+	High

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION								
		E	P	R	L	D	I / M	TOTAL	(+ OR -)	S		E	P	R	L	D	I / M	TOTAL	(+ OR -)	S
Skills development	Employees will develop and enhance skills thereby increasing experience and knowledge.	3	4	2	1	3	3	39	+	Medium	» In order to maximise the positive impact, it is suggested that the project company provide training courses for employees where feasible to ensure that employees gain as much as possible from the work experience. » Facilitate the transfer of knowledge between experienced employees and the staff. » Perform a skills audit to determine the potential skills that could be sourced in the area.	3	4	2	2	3	3	42	+	Medium
Increase in household earnings	Employed individuals will increase the income of their respective households and thereby experience an improvement in their standard of living.	3	4	3	1	1	4	48	+	High	» Local employment will benefit local households and the local area.	3	4	4	1	1	4	52	+	High
Increase in government revenue	The investment in the facility will generate revenue for the government during the construction period through a combination of personal income tax, VAT, companies' tax etc.	2	4	3	2	2	3	39	+	Medium	**N/A**	2	4	3	2	2	3	39	+	Medium

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION								
		E	P	R	L	D	I / M	TOTAL	(+ OR -)	S		E	P	R	L	D	I / M	TOTAL	(+ OR -)	S
Sense of place	Negative impact on sense of place (noise, dust and visual) for farmers where construction activities will take place	1	4	3	3	1	3	36	-	Medium	» Ensure landowner's preference is adhere to. » Install screens around the construction site to reduce the visual impact of construction on surrounding properties » Site watering (or use of appropriate dust suppressant) from time to time to reduce dust emitting from the construction site » Also refer to visual specialist report for mitigation measures.	1	4	3	2	1	2	22	-	Low
Safety and Security	Farmers might feel that the increase of accessibility will increase theft in the area	1	3	3	3	1	3	33	-	Medium	» Ensure proper 24/7 security is patrolling the construction sites, as well as controlled access	1	2	3	3	1	2	20	-	Low
Impact on agricultural operations	Loss of agricultural space	1	3	2	2	1	4	36	-	Medium	» Construct the solar panels and associated infrastructure on parts where the least arable land will be affected	1	3	1	2	1	3	24	-	Low
Impacts on economic and social infrastructure	An increase in traffic due to construction vehicles and heavy vehicles could create short-term disruptions and safety hazards for current road users.	3	3	2	2	1	3	33	-	Medium	» It is encouraged that the contractor (and/or subcontractors) to provide transportation for workers to and from the site to reduce potential congestion in proximity to the site » Transportation contractors must adhere to the road rules and regulations	3	3	2	2	1	2	22	-	Low

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION								
		E	P	R	L	D	I / M	TOTAL	(+ OR -)	S		E	P	R	L	D	I / M	TOTAL	(+ OR -)	S
											» Utilise only designated access routes and entrance/ exits from the site » Implement appropriate signage and road safety measures at entrance/ exit to the site and on site									
No-go alternative impact	If the decision is made not to proceed with the proposed project, there will be no resulting impact from a socio-economic perspective.																			

Table 6-6 outlines the input into the EMPr for the construction phase of the proposed Rhino PV Facility.

Table 6-4: Input To The EMPr – Construction Phase For the Sunnyside PV Facility

Impact	Mitigation	Responsibility	Methodology	Mitigation Objectives and time periods	Frequency
Expenditure associated with the construction of the proposed development will impact the production of the local economy.	» The project developer should use locally sourced inputs where feasible in order to maximize the benefit to the local economy. » Sub-contracting of local construction companies to occur as far as possible for the construction of facilities.	Contracts manager	Create database of local businesses and employees to engage with	During the construction phase	Once off
Temporary increase in country's GDP due to capital expenditure during the construction period	» The project developer is to use locally sourced inputs where feasible in order to maximize the benefit to the economy.	Contracts manager	Create database of local businesses and employees to engage with	During the construction phase	Once off

Impact	Mitigation	Responsibility	Methodology	Mitigation Objectives and time periods	Frequency
The construction of the proposed development will positively impact the community and beyond by creating a number of job opportunities (albeit temporary).	» Organise local community meetings, where feasible by appointing a CLO, to advise the local labour on the project that is planned to be established and the jobs that can potentially be applied for. » Where feasible, effort must be made to employ locally in order to create maximum benefit for the communities.	Contracts manager	Create database of local businesses and employees to engage with	Before construction commence	Before each construction phase
Employees will develop and enhance skills thereby increasing experience and knowledge.	» In order to maximise the positive impact, it is suggested that the project company provide training courses for employees where feasible to ensure that employees gain as much as possible from the work experience. » Facilitate the transfer of knowledge between experienced employees and the staff. » Perform a skills audit to determine the potential skills that could be sourced in the area.	The person that will be in charge of employment and workers contracts.	Set up apprenticeship programmes to build onto existing skill levels or develop new skills amongst construction workers, especially those from local communities	During the construction phase	Monthly
Employed individuals will increase the income of their respective households and thereby experience an improvement in their standard of living.	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
The investment in the facility will generate revenue for the government during the construction	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**

Impact	Mitigation	Responsibility	Methodology	Mitigation Objectives and time periods	Frequency
period through a combination of personal income tax, VAT, companies' tax etc.					
Negative impact on sense of place (noise, dust and visual) for farmers where construction activities will take place	» Install screens around the construction site to reduce the visual impact of construction on surrounding properties » Site watering (or use of appropriate dust suppressant) from when required to reduce dust emitting from the construction site. » Also refer to visual specialist report for mitigation measures.	Visual and noise specialists	The mitigation measures proposed by the visual and noise specialists should be adhered to	Throughout to construction phase	Daily
Farmers might feel that the increase of accessibility will increase theft in the area	» Ensure proper 24/7 security is patrolling the construction sites, as well as controlled access	Safety and Security Officer	Farmer should agree on access routes for contractors during construction phase, and strict adherence to no-go areas by workers with a penalty imposed if no-go areas are not adhered to	Throughout to construction phase	Daily
Loss of agricultural space	» Construct the solar panels on parts where the least arable land will be affected	Agricultural specialist	The mitigation measures proposed by the agricultural specialist should be adhere to	During the project planning phase	Once off
An impact on the demographics of the area as a result of in-migration in response to job opportunities will occur.	» Where feasible, effort must be made to employ local labour in order to create maximum benefit for the communities and limit in-migration. » Train unemployed local community members with insufficient skills and increase absorption of local labour thereby decreasing in-migration.	Human Resource	Set up a recruitment office and appoint a CLO in the nearby towns and adhere to strict labour recruitment practices that would reduce the desire of potential job seekers to loiter around the properties in the hope of finding temporary employment. Establish a management forum comprising key stakeholders to monitor and identify potential problems that may arise due to the influx of job seekers to the area	Before construction commence	Monthly

Impact	Mitigation	Responsibility	Methodology	Mitigation Objectives and time periods	Frequency
An increase in traffic due to construction vehicles and heavy vehicles could create short-term disruptions and safety hazards for current road users.	» It is encouraged that the contractor (and/or subcontractors) to provide transportation for workers to and from the site to reduce potential congestion in proximity to the site » Transportation contractors must adhere to the road rules and regulations » Utilise only designated access routes and entrance/ exits from the site » Implement appropriate signage and road safety measures at entrance/ exit to the site and on site	Traffic engineer, together with local municipalities and road authorities	Adhere to the mitigations of the traffic engineer and relevant road authorities	Throughout to construction phase	Daily

6.5.2 Impacts Ensued During Operations

Table 6-5 is the operational phase impacts imposed by the proposed Rhino PV Facility.

Table 6-5: Operational Phase Impacts For the Rhino PV Facility

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION								
		E	P	R	L	D	I / M	TOTAL	(+ OR -)	S		E	P	R	L	D	I / M	TOTAL	(+ OR -)	S
Operational Phase																				
Increase in production	Expenditure associated with the operations of the proposed development will impact the production of the local economy.	3	3	2	1	3	3	36	+	Medium	» The project developer should make effort to use locally sourced inputs where feasible in order to maximize the benefit to the local economy. » Local Small and Medium Enterprises are to be approached to investigate the opportunities for supplying inputs required for the maintenance and operation of the facility, as far as feasible.	3	3	2	2	3	3	39	+	Medium
Increase on GDP	Temporary increase in country's GDP due to operational expenditure	3	3	2	1	3	3	36	+	Medium	» The project developer is to try to use locally sourced inputs where feasible in order to maximize the benefit to the local economy. » Local Small and Medium Enterprises are to be approached to investigate the opportunities for supplying inputs required for the maintenance and operation of the facility, as far as feasible.	3	3	2	2	3	3	39	+	Medium

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION								
		E	P	R	L	D	I / M	TOTAL	(+ OR -)	S		E	P	R	L	D	I / M	TOTAL	(+ OR -)	S
Increase in Employment	The operation of the proposed development will positively impact the community and beyond by creating a number of job opportunities.	2	3	3	3	3	2	28	+	Medium	» Where feasible, effort must be made to employ locally in order to create maximum benefit for the communities.	2	4	3	3	3	2	30	+	Medium
Increase in household earnings	Employed individuals will increase the income of their respective households and thereby experience an improvement in their standard of living.	3	3	1	1	3	3	33	+	Medium	» Employing locally will increase benefit to local households and the local area	3	3	1	2	3	3	36	+	Medium
Increase in government revenue	The investment in the facility will generate revenue for the government during the construction period through a combination of personal income tax, VAT, companies' tax etc.	3	3	2	3	3	3	42	+	Medium	**N/A**	3	3	2	3	3	3	42	+	Medium
Rental revenue for landowners	The landowners will receive monthly/ annual compensation for the solar panels situated on their farms, this will help to increase the landowner's revenue to ensure sustainability on the farms.	1	3	2	3	3	3	36	+	Medium	**N/A**	1	3	2	3	3	3	36	+	Medium

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION								
		E	P	R	L	D	I / M	TOTAL	(+ OR -)	S		E	P	R	L	D	I / M	TOTAL	(+ OR -)	S
Sustainable increase in electricity	The additional electricity that will be generated will increase electricity supply in the country.	4	4	3	2	3	3	48	+	High	**N/A**	4	4	3	2	3	3	48	+	High
Sense of place	Negative impact on sense of place (noise and visual) for farmers where solar panels and associated infrastructure will be located.	1	3	2	2	3	3	33	-	Medium	» Refer to visual specialist report for mitigation measures.	1	3	2	2	3	3	33	-	Medium
Impact on agricultural operations	Loss of agricultural space	1	4	3	3	3	3	42	-	Medium	» Construct the solar panels on parts where the least arable land will be affected	1	3	3	3	3	3	39	-	Medium
No-go alternative impact	If the decision is made not to proceed with the proposed project, there will be no resulting impact from a socio-economic perspective.																			

Table 6-6 outlines the EMPr input for the operational phase of the proposed Rhino PV Facility.

Table 6-6: Input To The EMPr – Operational Phase For the Rhino PV Facility

Impact	Mitigation	Responsibility	Methodology	Mitigation Objectives and time periods	Frequency
Expenditure associated with the operations of the proposed development will impact the production of the local economy.	» The project developer should make effort to use locally sourced inputs where feasible in order to maximize the benefit to the local economy. » Local Small and Medium Enterprises are to be approached to investigate the opportunities for supplying inputs required for the maintenance and operation of the facility, as far as feasible.	Facility manager	Create database of local businesses and employees to engage with	Throughout the operational phase	Once off
Temporary increase in country's GDP due to operational expenditure	» Local Small and Medium Enterprises are to be approached to investigate the opportunities for supplying inputs required for the maintenance and operation of the facility, as far as feasible.	CLO	Create database of local businesses and employees to engage with by appointing a CLO.	Throughout the operational phase	Once off
The operation of the proposed development will positively impact the community and beyond by creating a number of job opportunities.	» Where feasible, effort must be made to employ locally in order to create maximum benefit for the communities.	CLO	The person that will be in charge of employment and workers contracts.	Throughout the operational phase	Quarterly
Employed individuals will increase the income of their respective households and thereby experience an improvement in their standard of living.	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
The investment in the facility will generate revenue for the government during the construction period through a combination of personal income tax, VAT, companies' tax etc.	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
The landowners will receive monthly/ annual compensation for the solar panels situated on their farms, this will help to	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**

Impact	Mitigation	Responsibility	Methodology	Mitigation Objectives and time periods	Frequency
increase the landowner's revenue to ensure sustainability on the farms.					
The additional electricity that will be generated will increase electricity supply in the country.	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
Negative impact on sense of place (noise and visual).	» Refer to visual specialist report for mitigation measures.				
Loss of agricultural space	» Construct the solar panels on parts where the least arable land will be affected	Agricultural specialist	The mitigation measures proposed by the agricultural specialist should be adhere to	During the project planning phase	Once off

Table 6-7 is the operational phase impacts imposed by the proposed Sunnyside PV Facility.

Table 6-7: Operational Phase Impacts For the Sunnyside PV Facility

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION								
		E	P	R	L	D	I / M	TOTAL	(+ OR -)	S		E	P	R	L	D	I / M	TOTAL	(+ OR -)	S
Operational Phase																				
Increase in production	Expenditure associated with the operations of the proposed development will impact the production of the local economy.	3	3	2	1	3	3	36	+	Medium	» The project developer should make effort to use locally sourced inputs where feasible in order to maximize the benefit to the local economy. » Local Small and Medium Enterprises are to be approached to investigate the opportunities for supplying inputs required for the maintenance and operation of the facility, as far as feasible.	3	3	2	2	3	3	39	+	Medium
Increase on GDP	Temporary increase in country's GDP due to operational expenditure	3	3	2	1	3	3	36	+	Medium	» The project developer is to try to use locally sourced inputs where feasible in order to maximize the benefit to the local economy. » Local Small and Medium Enterprises are to be approached to investigate the opportunities for supplying inputs required for the maintenance and operation of the facility, as far as feasible.	3	3	2	2	3	3	39	+	Medium
Increase in Employment	The operation of the proposed development will positively impact the community and beyond by	2	3	3	3	3	2	28	+	Medium	» Where feasible, effort must be made to employ locally in order to create maximum benefit for the communities.	2	4	3	3	3	2	30	+	Medium

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION								
		E	P	R	L	D	I / M	TOTAL	(+ OR -)	S		E	P	R	L	D	I / M	TOTAL	(+ OR -)	S
	creating a number of job opportunities.																			
Increase in household earnings	Employed individuals will increase the income of their respective households and thereby experience an improvement in their standard of living.	3	3	1	1	3	3	33	+	Medium	» Employing locally will increase benefit to local households and the local area	3	3	1	2	3	3	36	+	Medium
Increase in government revenue	The investment in the facility will generate revenue for the government during the construction period through a combination of personal income tax, VAT, companies' tax etc.	3	3	2	3	3	3	42	+	Medium	**N/A**	3	3	2	3	3	3	42	+	Medium
Rental revenue for landowners	The landowners will receive monthly/ annual compensation for the solar panels situated on their farms, this will help to increase the landowner's revenue to ensure sustainability on the farms.	1	3	2	3	3	3	36	+	Medium	**N/A**	1	3	2	3	3	3	36	+	Medium
Sustainable increase in electricity	The additional electricity that will be generated will increase electricity supply in the country.	4	4	3	2	3	3	48	+	High	**N/A**	4	4	3	2	3	3	48	+	High

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION								
		E	P	R	L	D	I / M	TOTAL	(+ OR -)	S		E	P	R	L	D	I / M	TOTAL	(+ OR -)	S
Sense of place	Negative impact on sense of place (noise and visual) for farmers where solar panels and associated infrastructure will be located.	1	3	2	2	3	2	22	-	Low	» Refer to visual specialist report for mitigation measures.	1	3	2	2	3	2	22	-	Low
Impact on agricultural operations	Loss of agricultural space	1	4	3	3	3	3	42	-	Medium	» Construct the solar panels on parts where the least arable land will be affected	1	3	2	2	3	2	22	-	Low
No-go alternative impact	If the decision is made not to proceed with the proposed project, there will be no resulting impact from a socio-economic perspective.																			

Table 6-8 outlines the EMPr input for the operational phase of the proposed Sunnyside PV Facility.

Table 6-8: Input To The EMPr – Operational Phase For the Sunnyside PV Facility

Impact	Mitigation	Responsibility	Methodology	Mitigation Objectives and time periods	Frequency
Expenditure associated with the operations of the proposed development will impact the production of the local economy.	» The project developer should make effort to use locally sourced inputs where feasible in order to maximize the benefit to the local economy. » Local Small and Medium Enterprises are to be approached to investigate the opportunities for supplying inputs required for the maintenance and operation of the facility, as far as feasible.	Facility manager	Create database of local businesses and employees to engage with	Throughout the operational phase	Once off
Temporary increase in country's GDP due to operational expenditure	» Local Small and Medium Enterprises are to be approached to investigate the opportunities for supplying inputs required for the maintenance and operation of the facility, as far as feasible.	CLO	Create database of local businesses and employees to engage with by appointing a CLO.	Throughout the operational phase	Once off
The operation of the proposed development will positively impact the community and beyond by creating a number of job opportunities.	» Where feasible, effort must be made to employ locally in order to create maximum benefit for the communities.	CLO	The person that will be in charge of employment and workers contracts.	Throughout the operational phase	Quarterly
Employed individuals will increase the income of their respective households and thereby experience an improvement in their standard of living.	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
The investment in the facility will generate revenue for the government during the construction period through a combination of personal income tax, VAT, companies' tax etc.	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
The landowners will receive monthly/ annual compensation for the solar panels situated on their farms, this will help to	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**

Impact	Mitigation	Responsibility	Methodology	Mitigation Objectives and time periods	Frequency
increase the landowner's revenue to ensure sustainability on the farms.					
The additional electricity that will be generated will increase electricity supply in the country.	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
Negative impact on sense of place (noise and visual).	» Refer to visual specialist report for mitigation measures.				
Loss of agricultural space	» Construct the solar panels on parts where the least arable land will be affected	Agricultural specialist	The mitigation measures proposed by the agricultural specialist should be adhere to	During the project planning phase	Once off

6.5.3 Impacts Ensued During Decommissioning

Table 6-9 is the decommissioning phase impacts imposed by the proposed Rhino PV Facility.

Table 6-9: Decommissioning Phase Impacts For the Rhino PV Facility

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION								
		E	P	R	L	D	I / M	TOTAL	(+ OR -)	S		E	P	R	L	D	I / M	TOTAL	(+ OR -)	S
Decommissioning Phase																				
Temporary Increase in production	Expenditure associated with the decommissioning of the proposed development will impact the production of the local economy.	3	4	3	1	1	3	36	+	Medium	» The project developer should use locally sourced inputs where feasible in order to maximize the benefit to the local economy.	3	4	4	1	1	3	39	+	Medium
Temporary Increase on GDP	Temporary increase in country's GDP due to capital expenditure during the decommissioning period	3	4	3	1	1	3	36	+	Medium	» The project developer is to use locally sourced inputs where feasible in order to maximize the benefit to the economy.	3	4	4	1	1	3	39	+	Medium
Temporary Increase in Employment	The decommissioning of the proposed development will positively impact the community and beyond by creating a number of job opportunities (albeit temporary).	3	3	3	1	1	3	33	+	Medium	» Where feasible, effort must be made to employ locally in order to create maximum benefit for the communities.	3	3	4	1	1	3	36	+	Medium
Increase in household earnings	Employed individuals will increase the income of their respective households and thereby experience an improvement in their standard of living.	3	3	3	1	1	3	33	+	Medium	» Local employment will benefit local households and the local area.	3	3	4	1	1	3	36	+	Medium
Land Restoration	After decommissioning, the land can be restored and repurposed for other uses, potentially increasing its economic value for activities like	1	4	2	2	1	3	30	+	Medium	**N/A**	1	4	2	2	1	3	30	-	Medium

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION								
		E	P	R	L	D	I / M	TOTAL	(+ OR -)	S		E	P	R	L	D	I / M	TOTAL	(+ OR -)	S
	agriculture, real estate development, or recreation.																			
Reduced Tax Revenue	SEFs contribute to local tax revenues. Decommissioning can lead to a reduction in tax income for municipalities and regions, impacting their ability to fund public services.	1	3	3	3	1	3	33	-	Medium	**N/A**	1	3	3	3	1	3	33	-	Medium
Cost Burden	Decommissioning can be expensive, and the financial responsibility often falls on the facility owner or local government. These costs can strain budgets and resources.	1	3	2	3	1	3	30	-	Medium	» Recommissioning a solar facility is essential to harness sustainable energy sources, reduce carbon emissions, and ensure long-term environmental and economic benefits, making it a sensible choice over decommissioning.	1	3	2	3	1	3	30	-	Medium
Loss of Energy Production	Decommissioning means the loss of renewable energy production, which can affect the availability of energy resources in the region.	2	3	3	3	3	3	42	-	High	» Recommissioning a solar facility is essential to harness sustainable energy sources, reduce carbon emissions, and ensure long-term environmental and economic benefits, making it a sensible choice over decommissioning.	2	3	3	3	2	3	39	-	Medium
Waste management	Effective waste management during the decommissioning phase of a solar farm is crucial for minimizing environmental impact, ensuring safe disposal of materials, and complying with regulations; however, it is costly due to specialized handling requirements and proper disposal methods.	2	3	3	1	1	3	30	-	Medium	**N/A**	2	3	3	1	1	3	30	+	Medium

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION								
		E	P	R	L	D	I / M	TOTAL	(+ OR -)	S		E	P	R	L	D	I / M	TOTAL	(+ OR -)	S
Loss of employment	Should the facility be decommissioned, jobs would be lost.	2	3	2	1	2	1	10	-	Low	» Recommissioning a solar facility is essential to harness sustainable energy sources, reduce carbon emissions, and ensure long-term environmental and economic benefits, making it a sensible choice over decommissioning.	2	3	2	1	2	1	10	-	Low

Table 6-10 describes the EMPr input for the decommissioning phase of the proposed Rhino PV Facility.

Table 6-10: Input To The EMPr – Decommissioning Phase (Rhino PV Facility)

Impact	Mitigation	Responsibility	Methodology	Mitigation Objectives and time periods	Frequency
Expenditure associated with the decommissioning of the proposed development will impact the production of the local economy.	» The project developer should use locally sourced inputs where feasible in order to maximize the benefit to the local economy.	Contracts manager	Create database of local businesses and employees to engage with	Before Decommissioning phase commence	Once Off
Temporary increase in country's GDP due to capital expenditure during the decommissioning period	» The project developer is to use locally sourced inputs where feasible in order to maximize the benefit to the economy.	Contracts manager	Create database of local businesses and employees to engage with	Before Decommissioning phase commence	Once Off
The decommissioning of the proposed development will positively impact the community and beyond by creating a number of job opportunities (albeit temporary).	» Where feasible, effort must be made to employ locally in order to create maximum benefit for the communities.	CLO	Create database of local businesses and employees to engage with by appointing a CLO.	Before Decommissioning phase commence	Once Off

Impact	Mitigation	Responsibility	Methodology	Mitigation Objectives and time periods	Frequency
Employed individuals will increase the income of their respective households and thereby experience an improvement in their standard of living.	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
After decommissioning, the land can be restored and repurposed for other uses, potentially increasing its economic value for activities like agriculture, real estate development, or recreation.	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
SEFs contribute to local tax revenues. Decommissioning can lead to a reduction in tax income for municipalities and regions, impacting their ability to fund public services.	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
Decommissioning can be expensive, and the financial responsibility often falls on the facility owner or local government. These costs can strain budgets and resources.	» Recommissioning a solar facility is essential to harness sustainable energy sources, reduce carbon emissions, and ensure long-term environmental and economic benefits, making it a sensible choice over decommissioning.	Project Owner	Project owners should consider applying for the necessary licencing to extend operations	Before Decommissioning phase commence	Once Off
Decommissioning means the loss of renewable energy production, which can affect the availability of energy resources in the region.	» Recommissioning a solar facility is essential to harness sustainable energy sources, reduce carbon emissions, and ensure long-term environmental and economic benefits, making it a sensible choice over decommissioning.	Project Owner	Project owners should consider applying for the necessary licencing to extend operations	Before Decommissioning phase commence	Once Off
Effective waste management during the decommissioning phase of a solar farm is crucial for minimizing environmental impact, ensuring safe disposal of materials, and complying with regulations; however, it is costly due to specialized handling requirements and proper disposal methods.	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**

Impact	Mitigation	Responsibility	Methodology	Mitigation Objectives and time periods	Frequency
Should the facility be decommissioned, jobs would be lost.	N/A	N/A	N/A	N/A	N/A

Table 6-11 is the decommissioning phase impacts imposed by the proposed Sunnyside PV Facility.

Table 6-11: Decommissioning Phase Impacts (For the Sunnyside PV Facility)

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION								
		E	P	R	L	D	I / M	TOTAL	(+ OR -)	S		E	P	R	L	D	I / M	TOTAL	(+ OR -)	S
Decommissioning Phase																				
Temporary Increase in production	Expenditure associated with the decommissioning of the proposed development will impact the production of the local economy.	3	4	3	1	1	3	36	+	Medium	» The project developer should use locally sourced inputs where feasible in order to maximize the benefit to the local economy.	3	4	4	1	1	3	39	+	Medium
Temporary Increase on GDP	Temporary increase in country's GDP due to capital expenditure during the decommissioning period	3	4	3	1	1	3	36	+	Medium	» The project developer is to use locally sourced inputs where feasible in order to maximize the benefit to the economy.	3	4	4	1	1	3	39	+	Medium
Temporary Increase in Employment	The decommissioning of the proposed development will positively impact the community and beyond by creating a number of job opportunities (albeit temporary).	3	3	3	1	1	3	33	+	Medium	» Where feasible, effort must be made to employ locally in order to create maximum benefit for the communities.	3	3	4	1	1	3	36	+	Medium

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION								
		E	P	R	L	D	I / M	TOTAL	(+ OR -)	S		E	P	R	L	D	I / M	TOTAL	(+ OR -)	S
Increase in household earnings	Employed individuals will increase the income of their respective households and thereby experience an improvement in their standard of living.	3	3	3	1	1	3	33	+	Medium	» Local employment will benefit local households and the local area.	3	3	4	1	1	3	36	+	Medium
Land Restoration	After decommissioning, the land can be restored and repurposed for other uses, potentially increasing its economic value for activities like agriculture, real estate development, or recreation.	1	4	2	2	1	3	30	+	Medium	**N/A**	1	4	2	2	1	3	30	-	Medium
Reduced Tax Revenue	SEFs contribute to local tax revenues. Decommissioning can lead to a reduction in tax income for municipalities and regions, impacting their ability to fund public services.	1	3	3	3	1	3	33	-	Medium	**N/A**	1	3	3	3	1	3	33	-	Medium
Cost Burden	Decommissioning can be expensive, and the financial responsibility often falls on the facility owner or local government. These costs can strain budgets and resources.	1	3	2	3	1	3	30	-	Medium	» Recommissioning a solar facility is essential to harness sustainable energy sources, reduce carbon emissions, and ensure long-term environmental and economic benefits, making it a sensible choice over decommissioning.	1	3	2	3	1	3	30	-	Medium
Loss of Energy Production	Decommissioning means the loss of renewable energy production, which can affect the availability of energy resources in the region.	2	3	3	3	3	3	42	-	High	» Recommissioning a solar facility is essential to harness sustainable energy sources, reduce carbon emissions, and ensure long-term environmental and economic benefits, making it a sensible choice over decommissioning.	2	3	3	3	2	3	39	-	Medium

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION								
		E	P	R	L	D	I / M	TOTAL	(+ OR -)	S		E	P	R	L	D	I / M	TOTAL	(+ OR -)	S
Waste management	Effective waste management during the decommissioning phase of a solar farm is crucial for minimizing environmental impact, ensuring safe disposal of materials, and complying with regulations; however, it is costly due to specialized handling requirements and proper disposal methods.	2	3	3	1	1	3	30	-	Medium	**N/A**	2	3	3	1	1	3	30	+	Medium
Loss of employment	Should the facility be decommissioned, jobs would be lost.	2	3	2	1	2	1	10	-	Low	» Recommissioning a solar facility is essential to harness sustainable energy sources, reduce carbon emissions, and ensure long-term environmental and economic benefits, making it a sensible choice over decommissioning.	2	3	2	1	2	1	10	-	Low

Table 6-12 describes the EMPr input for the decommissioning phase of the proposed Sunnyside PV Facility.

Table 6-12: Input To The EMPr – Decommissioning Phase For the Sunnyside PV Facility

Impact	Mitigation	Responsibility	Methodology	Mitigation Objectives and time periods	Frequency
Expenditure associated with the decommissioning of the proposed development will impact the production of the local economy.	» The project developer should use locally sourced inputs where feasible in order to maximize the benefit to the local economy.	Contracts manager	Create database of local businesses and employees to engage with	Before Decommissioning phase commence	Once Off

Impact	Mitigation	Responsibility	Methodology	Mitigation Objectives and time periods	Frequency
Temporary increase in country's GDP due to capital expenditure during the decommissioning period	» The project developer is to use locally sourced inputs where feasible in order to maximize the benefit to the economy.	Contracts manager	Create database of local businesses and employees to engage with	Before Decommissioning phase commence	Once Off
The decommissioning of the proposed development will positively impact the community and beyond by creating a number of job opportunities (albeit temporary).	» Where feasible, effort must be made to employ locally in order to create maximum benefit for the communities.	Contracts manager	Create database of local businesses and employees to engage with	Before Decommissioning phase commence	Once Off
Employed individuals will increase the income of their respective households and thereby experience an improvement in their standard of living.	» Local employment will benefit local households and the local area.	Human Resources	Create database of local businesses and employees to engage with	Before Decommissioning phase commence	Once Off
After decommissioning, the land can be restored and repurposed for other uses, potentially increasing its economic value for activities like agriculture, real estate development, or recreation.	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
SEFs contribute to local tax revenues. Decommissioning can lead to a reduction in tax income for municipalities and regions, impacting their ability to fund public services.	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
Decommissioning can be expensive, and the financial responsibility often falls on the facility owner or local government. These costs can strain budgets and resources.	» Recommissioning a solar facility is essential to harness sustainable energy sources, reduce carbon emissions, and ensure long-term environmental and economic benefits, making it a sensible choice over decommissioning.	Project Owner	Project owners should consider applying for the necessary licencing to extend operations	Before Decommissioning phase commence	Once Off
Decommissioning means the loss of renewable energy production, which can affect the availability of energy resources in the region.	» Recommissioning a solar facility is essential to harness sustainable energy sources, reduce carbon emissions, and ensure long-term	Project Owner	Project owners should consider applying for the necessary licencing to extend operations	Before Decommissioning phase commence	Once Off

Impact	Mitigation	Responsibility	Methodology	Mitigation Objectives and time periods	Frequency
	environmental and economic benefits, making it a sensible choice over decommissioning.				
Effective waste management during the decommissioning phase of a solar farm is crucial for minimizing environmental impact, ensuring safe disposal of materials, and complying with regulations; however, it is costly due to specialized handling requirements and proper disposal methods.	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
Should the facility be decommissioned, jobs would be lost.	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**

6.6 CUMULATIVE IMPACTS

Cumulative impacts in a SEIA refer to the combined effects of various factors over time, considering their interactive and co-operative effects on communities, economies, and social well-being, providing a comprehensive understanding of the consequences of similar projects. Other known authorised RE facilities have been identified that will create the conditions for cumulative effect, indicated in Table 6-13 and Map 6-1 below.

Table 6-13: Approved Projects

Project	Technology	Capacity (MW)
The construction of a 120 MW PV SEF (known as the Bulkskop PV) located on the remaining extent (Portion 0) of Farm 423 approximately 12 km south-east of Beaufort West in the Beaufort West Local Municipality, Western Cape Province	PV	120
The construction of a 120 MW PV SEF (known as the Gamka PV) located on the remaining extent (Portion 0) of Farm 423 approximately 12 km south-east of Beaufort West in the Beaufort West Local Municipality, Western Cape Province	PV	120
The construction of 120 MW PV SEF (known as the Hardeveld PV) located on the remaining extent (Portion 0) of Farm 423, Western Cape Province	PV	120
The construction of a 120 MW PV SEF (known as Hoodia PV) in the Beaufort West Local Municipality, Western Cape Province	PV	120
The construction of a 120 MW PV SEF (known as the Rosenia PV), Western Cape Province	PV	120
Proposed Construction of 19 MW PV Solar Facility Proposed by Lurama 214 Pty Ltd on Portion 1 of the Farm Steenrotsfontein 168, Beaufort West, Western Cape Province	PV	19
Proposed Construction of 19 MW PV Solar Facility Proposed by Lurama 214 Pty Ltd on Portion 1 of the Farm Steenrotsfontein 168, Beaufort West, Western Cape Province	PV	0
Proposed Construction of 19 MW PV Solar Facility Proposed by Lurama 214 Pty Ltd on Portion 1 of the Farm Steenrotsfontein 168, Beaufort West, Western Cape Province	PV	0
Proposed Construction of 19 MW PV Solar Facility Proposed by Lurama 214 (Pty) Ltd on Portion 1 of the Farm Steenrotsfontein 168, Beaufort West, Western Cape Province	PV	0

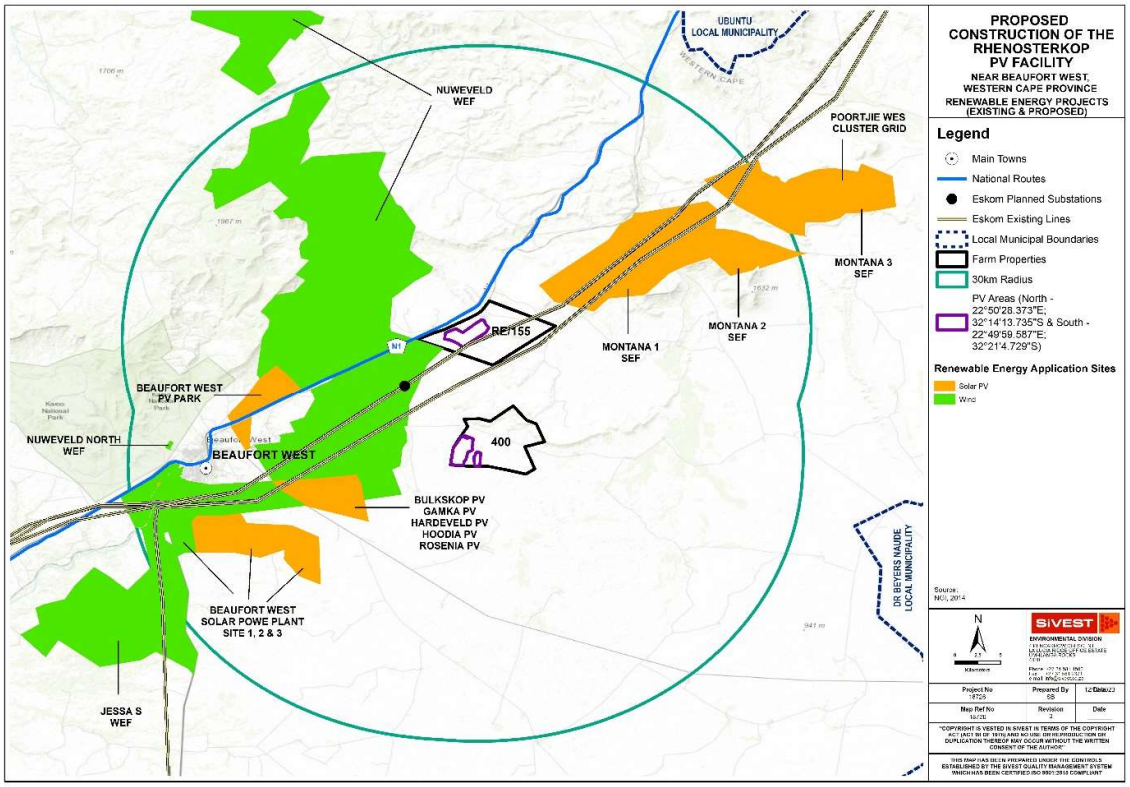
Project	Technology	Capacity (MW)
Proposed Construction of 19 MW PV Solar Facility Proposed by Lurama 214 (Pty) Ltd on Portion 1 of the Farm Steenrotsfontein 168, Beaufort West, Western Cape Province	PV	0
The Proposed Beaufort West Photovoltaic Park on Portion 9 of the Farm 161 Kuilspoort in the Western Cape Province	PV	85
The Proposed Beaufort West PV Park on Portion 9 of the Farm 161 Kuilspoort in the Western Cape Province	PV	0
Proposed 75 MW Beaufort West PV Project, Western Cape Province	PV	75
Proposed establishment of the Beaufort West Solar Power Plant Site 1, Western Cape Province	PV	90
Proposed Establishment of the Beaufort West Solar Power Plant Site 2, Western Cape Province	PV	90
Proposed Beaufort West Solar power plant site 3 near Beaufort West, Western Cape Province	PV	90
The proposed 220 MW Jessa M WEF and associated infrastructure near Beaufort West in the Western Cape Province	Wind	220
The proposed 220MW Jessa Z WEF and associated infrastructure, near Beaufort West in the Western Cape Province	Wind	220
N1 Wind Farm, Beaufort West	Wind	240/ 160/ 80/ 72.5
Proposed Development of the 140 MW Beaufort West Wind Farm in the Prince Albert Local Municipality, Western Cape Province	Wind	140
Proposed Nuweveld 132/400 kV Powerline near Beaufort West, Western Cape province		
Proposed Construction of 400 kV Powerline from Blanco Substation (George) to Droerivier Substation (Beaufort West), Western Cape		
Genelania 132/400 kV Main Transmission Substation and 400 kV Overhead Line associated with Beaufort West Wind Farm		
132/400 kV Main Transmission Substation and 400 kV Overhead Line associated with Beaufort West Wind Farm		
33/132 kV Independent Power Producer (Varsfontein) substation associated with Beaufort West Wind Farm		
33/132 kV Eskom Switching (Varsfontein) Station and 132 overhead line associated with Beaufort West Wind Farm		
140 MW Beaufort West Wind Farm	Wind	140
Proposed development of a radio mast, approximately 90 m in height on Portion 1 of Farm no. 15 of Trakaskuilen located on the Beaufort		

Project	Technology	Capacity (MW)
West cluster of wind farm developments, near the town of Beaufort West in the Western Cape Province		
Proposed Dolerite Mine on a portion of remaining portion of the farm Rhenosterkop no 155, registration division of Beaufort West, Western Cape Province	Mine	

Only cumulative impacts that will have the potential for a significant influence are analysed:

- **Increase in GDP and production -** The initial investment spend on the project will inject significant business sales/ production for the local and regional economy. The economic impact arising from the initial investment will be felt throughout the economy with windfall effects benefitting related sectors in the economy.
- **Employment creation -** Increase in employment creation for the local workforce.
- **Demographic shifts -** Influx of migrant labour and job seekers due to job opportunities presented by numerous projects.
- **Sense of place –** The numerous facilities will have an impact on the sense of place regarding the local services as well as accommodation facilities.

Map 6-1: Cumulative Projects within 30 km Radius of Proposed Project



Source: (SiVEST, 2023)

In addition to the negative cumulative impact noted above (i.e., demographic shifts), numerous positive impacts are expected to accumulate in the region such as increased production, GDP, employment, skills and household income.

Table 6-14: Cumulative Impacts

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION								
		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S
Cumulative																				
Increase in production	Expenditure associated with the construction of the projects will have an impact on the production of the local economy.	3	4	3	4	4	3	54	+	High	N/A	3	4	3	4	4	3	54	+	High
Increase on GDP	Temporary increase in country's GDP due to capital expenditure	3	4	3	4	4	3	54	+	High	N/A	3	4	3	4	4	3	54	+	High
Increase in Employment	The construction of the Projects will positively impact the community and beyond by creating a number of job opportunities (albeit temporary).	3	4	3	3	4	3	51	+	High	» Organise local community meetings to advise the local labour on the project that is planned to be established and the jobs that can potentially be applied for. » Where feasible, effort must be made to employ locally in order to create maximum benefit for the communities.	3	4	4	3	4	3	54	+	High
Temporary increase in social conflicts	An impact on the demographics of the area as a result of in-	2	3	3	3	1	3	36	-	Medium	» Where feasible, effort must be made to employ local labour in order to create maximum benefit for the communities and limit in-	2	3	2	3	1	3	33	-	Medium

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION								
		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S
associated with the influx of people	migration in response to job opportunities will occur.										migration. » Train unemployed local community members with insufficient skills and increase absorption of local labour thereby decreasing in-migration.									
Sense of place	The high number of facilities will have an impact on the geographical look of the local area, impacting potential local services and accommodation facilities.	3	4	3	3	1	3	42	-	Medium	» Ensure landowner's preference is adhere to. » Install screens around the construction site to reduce the visual impact of construction on surrounding properties. » Site watering (or use of appropriate dust suppressant) from time to time to reduce dust emitting from the construction site. » Also refer to visual specialist report for mitigation measures.	1	4	3	3	1	3	36	-	Medium

7 PROJECT ALTERNATIVES

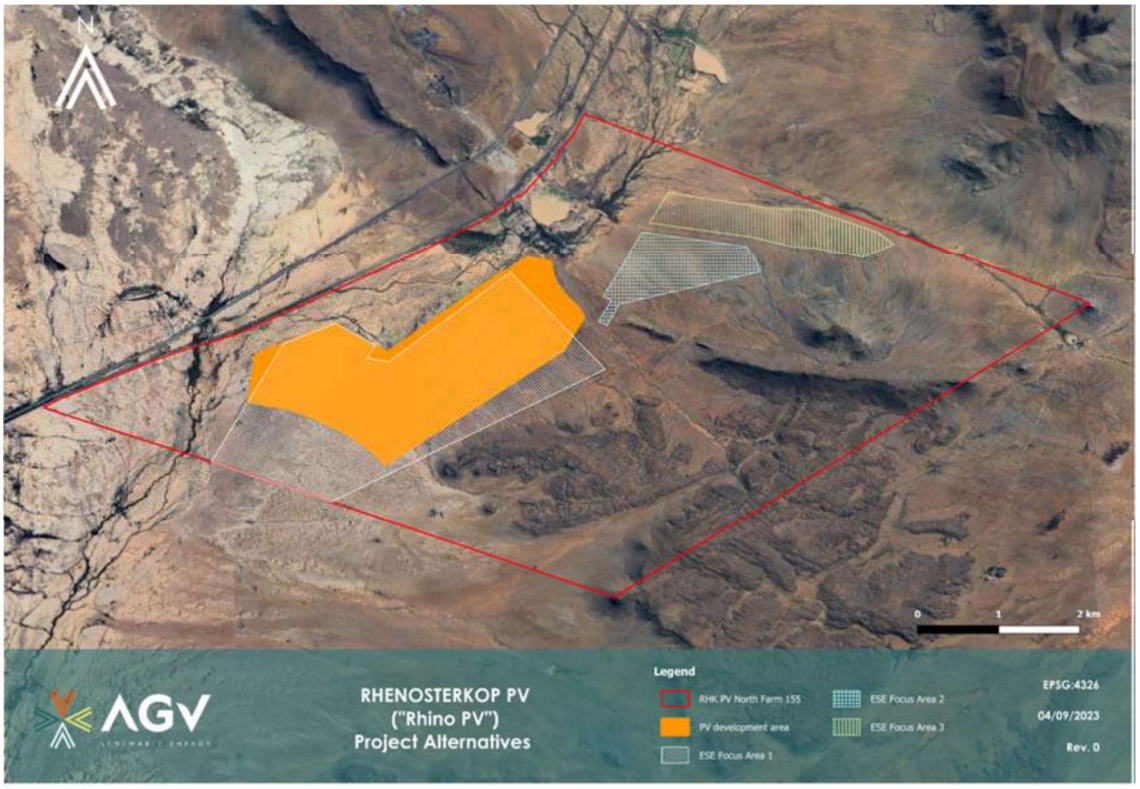
The proposed development as described above has been assessed with the following alternatives:

7.1 LOCATION ALTERNATIVES

7.1.1 Rhino PV Facility

As per SiVEST (2023), originally, for the solar PV facility, the farm Rhenosterkop 155 was identified as most suitable from a topographic, local, and environmental perspective. However, due to an avifauna (Martial Eagle) perspective no-development buffer, the development area was reduced significantly. Farm Rhenosterkop 155, the development footprint was reduced to what is shown in Map 7-1. The layouts consider the Environmental Screening Establishment (ESE) results, and the landowner's comments and recommendations.

Map 7-1: Rhino PV original development area (white, blue and green polygons) versus agreed upon development area (orange).

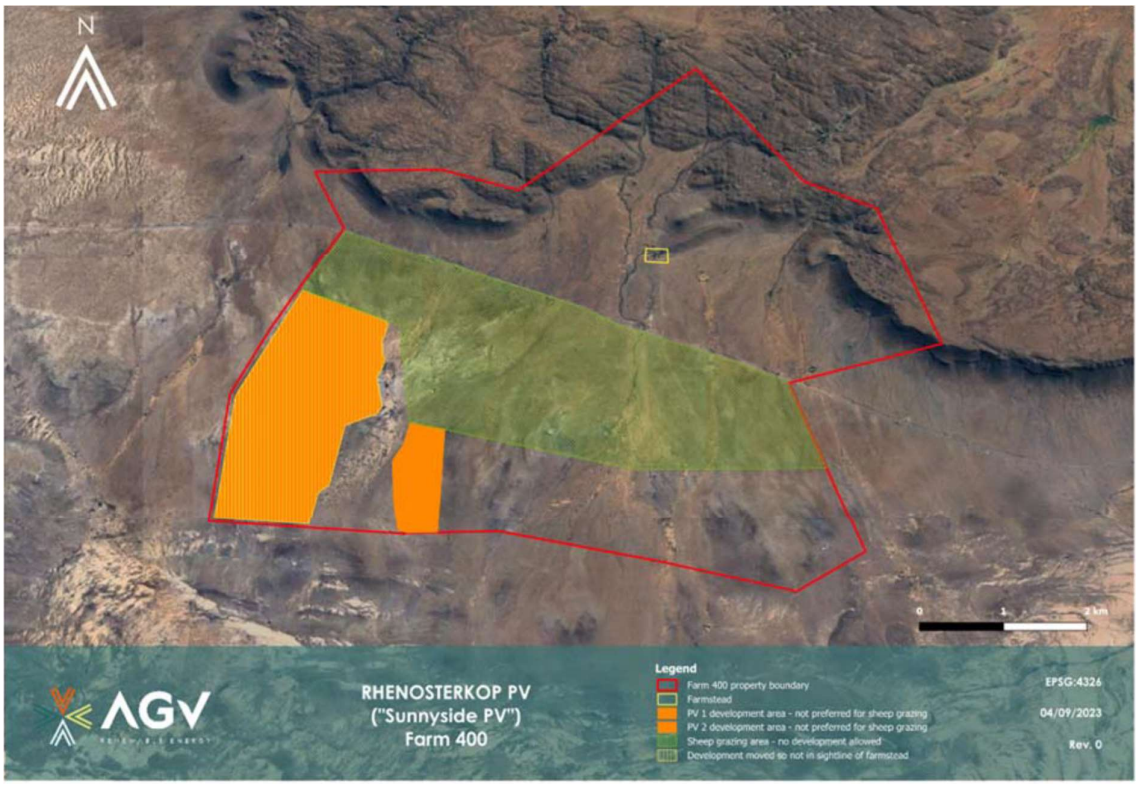


Source: (SiVest, 2023)

7.1.2 Sunnyside PV Facility

As per SiVEST (2023), the development proposed on Farm 400 needed to be located to the southwest of the property so that it is not visible from the farmstead. A layout was then developed and discussed with the landowner which was agreed upon (Map 7-2). Presented with the proposed development area, the landowner noted their support of the development, and that development would be within an area that is not preferred by sheep for grazing that always migrate back to the preferred areas (green polygon) as shown in Map 7-2.

Map 7-2: Sunnyside PV original development area (green) versus agreed upon development area



Source: (SiVest, 2023)

Other alternative locations were identified and assessed from a development perspective. The alternative locations, including surrounding farms, are less desirable to develop due to increased distance from the cluster. From a financial and environmental perspective, the development of other properties would also require additional servitudes that may not be feasible from a cost perspective. Considering the above, no further alternatives have been considered for the proposed solar PV facilities. RE development in South Africa is highly desirable from a social, environmental and development point of view, and a solar energy installation is more suitable for the site due to the high solar resource. This site is preferred due to the suitable climate, conditions and topography including close proximity to the national grid. Based on the above site-specific attributes, the study area is considered highly preferred in terms of the development of solar and wind energy facilities. As such, no further property/ location alternatives have been considered.

7.2 NO-GO ALTERNATIVE

As mentioned earlier, the “no go” alternative is the option of declining to proceed with the proposed development. In which case the status quo and/or current activities on the project site would continue. If this option is chosen, there will be no impact on the existing environmental baseline and no benefits to the local economy and affected communities. The “no go” alternative thus bears the opportunity cost of socioeconomic benefits to the local community that will go unrealised. Since the positive effects and impacts of an expanded energy system are expected to outweigh the negative effects, the construction of the proposed development is preferred over the “no go” alternative.

8 CONCLUSION AND RECOMMENDATIONS

8.1 SUMMARY OF THE ASSESSED IMPACTS

This SEIA report concentrated on gathering both secondary and primary data to establish a comprehensive social baseline, essential for identifying potential socio-economic impacts linked to the proposed development. This report aimed to create a foundation against which the potential social and economic consequences of the development project could be thoroughly assessed and understood. A summary of the potential positive and negative impacts identified for the detailed design and construction, operational and decommissioning phases are presented in the tables below Table 8-1 to Table 8-6. A summary of the identified cumulative impacts is presented in Table 8-7.

Table 8-1: Summary of potential socio-economic impacts identified for the construction phase (Rhino PV Facility)

Impact	Status	Significance (After mitigations/enhancements)
Increase in production	Positive	High (52)
Increase on GDP	Positive	High (52)
Increase in Employment	Positive	High (48)
Skills development	Positive	Medium (42)
Increase in household earnings	Positive	High (52)
Increase in government revenue	Positive	Medium (39)
Sense of place	Negative	Medium (33)
Safety and Security	Negative	Low (20)
Impact on agricultural operations	Negative	Medium (33)
Impacts on economic and social infrastructure	Negative	Low (22)
No-go alternative impact	If the decision is made not to proceed with the proposed project, there will be no resulting impact from a socio-economic perspective.	

Table 8-2: Summary of potential socio-economic impacts identified for the construction phase (Sunnyside PV Facility)

Impact	Status	Significance (After mitigations/enhancements)
Increase in production	Positive	High (52)
Increase on GDP	Positive	High (52)
Increase in Employment	Positive	High (48)
Skills development	Positive	Medium (42)
Increase in household earnings	Positive	High (52)
Increase in government revenue	Positive	Medium (39)
Sense of place	Negative	Low (22)
Safety and Security	Negative	Low (20)

Impact on agricultural operations	Negative	Low (24)
Impacts on economic and social infrastructure	Negative	Low (22)
No-go alternative impact	If the decision is made not to proceed with the proposed project, there will be no resulting impact from a socio-economic perspective.	

Table 8-3: Summary of potential socio-economic impacts identified for the operational phase (Rhino PV Facility)

Impact	Status	Significance (After mitigations/enhancements)
Increase in production	Positive	Medium (39)
Increase on GDP	Positive	Medium (39)
Increase in Employment	Positive	Medium (30)
Increase in household earnings	Positive	Medium (36)
Increase in government revenue	Positive	Medium (42)
Rental revenue for landowners	Positive	Medium (36)
Sustainable increase in electricity	Positive	High (48)
Sense of place	Negative	Low (33)
Impact on agricultural operations	Negative	Medium (39)
No-go alternative impact	If the decision is made not to proceed with the proposed project, there will be no resulting impact from a socio-economic perspective.	

Table 8-4: Summary of potential socio-economic impacts identified for the operational phase (Sunnyside PV Facility)

Impact	Status	Significance (After mitigations/enhancements)
Increase in production	Positive	Medium (39)
Increase on GDP	Positive	Medium (39)
Increase in Employment	Positive	Medium (30)
Increase in household earnings	Positive	Medium (36)
Increase in government revenue	Positive	Medium (42)
Rental revenue for landowners	Positive	Medium (36)
Sustainable increase in electricity	Positive	High (48)
Sense of place	Negative	Low (22)
Impact on agricultural operations	Negative	Low (22)
No-go alternative impact	If the decision is made not to proceed with the proposed project, there will be no resulting impact based on a socio-economic perspective.	

Table 8-5: Summary of potential socio-economic impacts identified for the decommissioning phase (Rhino PV Facility)

Impact	Status	Significance (After mitigations/enhancements)
Temporary Increase in production	Positive	Medium (39)
Temporary Increase on GDP	Positive	Medium (39)
Temporary Increase in Employment	Positive	Medium (36)
Increase in household earnings	Positive	Medium (36)
Land Restoration	Positive	Medium (30)
Reduced Tax Revenue	Negative	Medium (33)
Cost Burden	Negative	Medium (30)
Loss of Energy Production	Negative	Medium (39)
Waste management	Negative	Medium (30)
No-go alternative impact	If the decision is made not to proceed with the proposed project, there will be no resulting impact from a socio-economic perspective.	

Table 8-6: Summary of potential socio-economic impacts identified for the decommissioning phase (Sunnyside PV Facility)

Impact	Status	Significance (After mitigations/enhancements)
Temporary Increase in production	Positive	Medium (39)
Temporary Increase on GDP	Positive	Medium (39)
Temporary Increase in Employment	Positive	Medium (36)
Increase in household earnings	Positive	Medium (36)
Land Restoration	Positive	Medium (30)
Reduced Tax Revenue	Negative	Medium (33)
Cost Burden	Negative	Medium (30)
Loss of Energy Production	Negative	Medium (39)
Waste management	Negative	Medium (30)

Table 8-7: Summary of potential cumulative impacts

Impact	Status	Significance (After mitigations/enhancements)
Impact on Production	Positive	High (54)
Increase on GDP	Positive	High (54)
Employment Creation	Positive	High (54)
Influx of people	Negative	Medium (33)
Sense of place	Negative	Medium (36)

The potential social and economic impacts identified for the project are listed within the tables above and have been identified based on an assessment of available information and the current understanding of the proposed development.

8.2 CONCLUSION

A number of potential positive and negative social impacts have been identified for the proposed development during this BA process. Based on the findings, no red flags or fatal flaws have been identified from a socio-economic perspective which could preclude the progress of the proposed development.

8.3 RECOMMENDATIONS

The net positive impacts associated with the construction of the proposed development are expected to outweigh the net negative effects. The development is also envisaged to have a positive stimulus on the local economy and employment creation, leading to the economy's diversification and a small reduction in the unemployment rate.

The proposed Rhino PV and Sunnyside PV facilities should therefore be considered for development. It should, however, be acknowledged that the negative impacts would be largely borne by the nearby farms and households residing on them, whilst the positive impacts will be distributed throughout both the local and national economies. Due to this imbalance, it is recommended that the mitigation measures suggested, be strictly adhered to. Application of these mitigation measures will ensure that the negative impacts on the nearby farms and businesses are minimised and that the distribution of the potential benefits of the project are more balanced. It is important to value the landowners concerns and thus advised that further communication towards the landowners will be vital for the project.

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ANNEXURE A: IMPACT ASSESSMENT METHODOLOGY

Environmental Impact Assessment Methodology:

The Environmental Impact Assessment Methodology assists in evaluating the overall effect of a proposed activity on the environment. Determining the significance of an environmental impact on an environmental parameter is determined through a systematic analysis.

Determination of Significance of Impacts:

Significance is determined through a synthesis of impact characteristics which include context and intensity of an impact. Context refers to the geographical scale (i.e., site, local, national, or global), whereas intensity is defined by the severity of the impact e.g., the magnitude of deviation from background conditions, the size of the area affected, the duration of the impact and the overall probability of occurrence. Significance is calculated as shown in the table below.

Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. The total number of points scored for each impact indicates the level of significance of the impact.

Impact Rating System:

The impact assessment must take account of the nature, scale and duration of effects on the environment and whether such effects are positive (beneficial) or negative (detrimental). Each issue / impact is also assessed according to the various project stages, as follows:

- Planning.
- Construction.
- Operation; and
- Decommissioning.

Where necessary, the proposal for mitigation or optimization of an impact should be detailed. A brief discussion of the impact and the rationale behind the assessment of its significance has also been included.

The significance of Cumulative Impacts should also be rated (As per the Excel Spreadsheet Template).

Rating System Used to Classify Impacts:

The rating system is applied to the potential impact on the receiving environment and includes anobjective evaluation of the possible mitigation of the impact. Impacts have been consolidated into one rating. In assessing the significance of each issue, the following criteria (including an allocated pointsystem) is used:

ENVIRONMENTAL PARAMETER
A brief description of the environmental aspect likely to be affected by the proposed activity (e.g., Surface Water).
ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE
Include a brief description of the impact of environmental parameter being assessed in the context of the project. This criterion includes a brief written statement of the environmental aspect being impacted upon by

a particularaction or activity (e.g., oil spill in surface water).		
EXTENT (E)		
This is defined as the area over which the impact will be expressed. Typically, the severity and significance of an impact has different scales and as such bracketing ranges are often required. This is often useful during the detailed assessment of a project in terms of further defining the determined.		
1	Site	The impact will only affect the site
2	Local/district	Will affect the local area or district
3	Province/region	Will affect the entire province or region
4	International and National	Will affect the entire country
PROBABILITY (P)		
This describes the chance of occurrence of an impact		
1	Unlikely	The chance of the impact occurring is extremely low (Less than a 25% chance of occurrence).
2	Possible	The impact may occur (Between a 25% to 50% chance of occurrence).
3	Probable	The impact will likely occur (Between a 50% to 75% chance of occurrence).
4	Definite	Impact will certainly occur (Greater than a 75% chance of occurrence).
REVERSIBILITY (R)		
This describes the degree to which an impact on an environmental parameter can be successfully reversed upon completion of the proposed activity.		
1	Completely reversible	The impact is reversible with implementation of minor mitigation measures
2	Partly reversible	The impact is partly reversible but more intense mitigation measures are required.
3	Barely reversible	The impact is unlikely to be reversed even with intense mitigation measures.
4	Irreversible	The impact is irreversible, and no mitigation measures exist.
IRREPLACEABLE LOSS OF RESOURCES (L)		
This describes the degree to which resources will be irreplaceably lost as a result of a proposed activity.		
1	No loss of resource.	The impact will not result in the loss of any resources.
2	Marginal loss of resource	The impact will result in marginal loss of resources.
3	Significant loss of resources	The impact will result in significant loss of resources.
4	Complete loss of resources	The impact is result in a complete loss of all resources.
DURATION (D)		
This describes the duration of the impacts on the environmental parameter. Duration indicates the lifetime of the impact because of the proposed activity.		

1	Short term	The impact and its effects will either disappear with mitigation or will be mitigated through natural process in a span shorter than the construction phase (0 – 1 years), or the impact and its effectswill last for the period of a relatively short construction period and a limited recovery time after construction, thereafter it will be entirely negated (0 – 2 years).
2	Medium term	The impact and its effects will continue or last for some time after the construction phase but will be mitigated by direct humanaction or by natural processes thereafter (2 – 10 years).
3	Long term	The impact and its effects will continue or last for the entireoperational life of the development but will be mitigated by direct human action or by natural processes thereafter (10 – 50 years).
4	Permanent	The only class of impact that will be non-transitory. Mitigation either by man or natural process will not occur in such a way or such a time span that the impact can be considered transient (Indefinite).
INTENSITY / MAGNITUDE (I / M)		
Describes the severity of an impact (i.e., whether the impact has the ability to alter the functionality or quality of a system permanently or temporarily).		
1	Low	Impact affects the quality, use and integrity of the system/component in a way that is barely perceptible.
2	Medium	Impact alters the quality, use and integrity of the system/component but system/ component continues to function in a moderately modified way and maintains general integrity (some impact on integrity).
3	High	Impact affects the continued viability of the system/component, and the quality, use, integrity and functionality of the system or component is severely impaired and may temporarily cease. High costs of rehabilitation and remediation.
4	Very high	Impact affects the continued viability of the system/component, and the quality, use, integrity and functionality of the system or component permanently ceases and is irreversibly impaired (system collapse). Rehabilitation and remediation are oftenimpossible. If possible, rehabilitation and remediation often unfeasible due to extremely high costs of rehabilitation and remediation.

SIGNIFICANCE (S)		
Significance is determined through a synthesis of impact characteristics. Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. This describes the significance of the impact on the environmental parameter. The calculation of the significance of an impact uses the following formula: **Significance = (Extent + probability + reversibility + irreplaceability + duration) x magnitude/intensity.**		
The summation of the different criteria will produce a non-weighted value. By multiplying this value with the magnitude/intensity, the resultant value acquires a weighted characteristic which can be measured and assigneda significance rating.		
Points	**Impact Significance Rating**	**Description**
5 to 23	Negative Low impact	The anticipated impact will have negligible negative effects and will require little to no mitigation.
5 to 23	Positive Low impact	The anticipated impact will have minor positive effects.
24 to 42	Negative Medium impact	The anticipated impact will have moderate negative effects and will require moderate mitigation measures.
24 to 42	Positive Medium impact	The anticipated impact will have moderate positive effects.
43 to 61	Negative High impact	The anticipated impact will have significant effects and will require significant mitigation measures to achieve an acceptable level ofimpact.
43 to 61	Positive High impact	The anticipated impact will have significant positive effects.
62 to 80	Negative Very high impact	The anticipated impact will have highly significant effects and areunlikely to be able to be mitigated adequately. These impacts could be considered "fatal flaws".
62 to 80	Positive Very high impact	The anticipated impact will have highly significant positive effects.

ANNEXURE B: SPECIALIST CURRICULUM VITAE

Pierre van Jaarsveld

Date of Birth:	14 November 1982
Profession:	Regional Manager
Profession:	Senior Development Economist
Specialisation:	Impact Assessments and Enterprise Development
Years within Firm:	17 Years
Nationality:	RSA
Years of Experience:	17 Years
HDI Status:	White Male

Education:	
University of Pretoria - 2007	B.TRP HONS (Town and Regional Planning)

Professional Membership:
The Economic Society of South Africa (ESSA) #00116
SAPOA - Urban-Econ Development Economists (Pty) Ltd

Language Proficiency:	Reading	Writing	Speaking
English	Excellent	Excellent	Excellent
Afrikaans	Excellent	Excellent	Excellent

Work Experience:

2007 - Current	Urban-Econ Development Economists

Key Qualification:

Pierre van Jaarsveld completed his B.TRP Town and Regional Planning degree at the University of Pretoria, South Africa. His interests lie in property market analysis, feasibility analysis, project management, and project implementation. He built up valuable experience in Local Economic Development, agricultural development, enterprise development and impact modelling. He has managed feasibility studies for various property and economic studies, such as integrated housing projects. He has also facilitated a number of urban and rural renewal and development projects focusing on job creation opportunities and broadening the local economic base through investment attraction in bankable projects.

Pierre currently serves as manager of Urban-Econ Mpumalanga and Free State and is responsible for the day-to-day operations of the office in Mbombela.

Experience Record:	
Project:	Limpopo Road Safety Programme Microenterprises for Maintenance Business Plan
Year:	2023
Location:	Limpopo Province
Client:	The Impact Catalyst
Project Features:	Pre-Feasibility, Feasibility, Business Plan and Co-Funding Strategy
Position held:	Project Manager
Activities Performed:	Develop a blueprint for LRSP Microenterprises for road maintenance within the Limpopo Province. Conducted a pre-feasibility, feasibility and business plan. The project also required a co-funding strategy to get the private sector on board in financing the project with the public sector.
Project:	PPE Manufacturing Plant Business Plan
Year:	2023
Location:	Mpumalanga Province
Client:	The Impact Catalyst
Project Features:	Pre-Feasibility, Feasibility and Business Plan
Position held:	Project Manager
Activities Performed:	Identification of a suitable location for a PPE manufacturing plant within the Mpumalanga Province. The project also required a pre-feasibility study, the selection of a suitable SMME partner to drive the project and a detailed feasibility study. Once feasibility was established a business plan was formulated to assist with the successful funding and implementation of the project.

Project:	Parkdene Filling Station SEIA
Year:	2022
Location:	George, Western Cape
Client:	Lookforward Construction (Pty) Ltd
Project Features:	Socio-Economic Impact Assessment
Position held:	Project Manager
Activities Performed:	Socio-Economic Impact Assessment to determine the social and economic impacts as a result of the establishment of a petrol filling station in George. The social and economic impacts were determined and the significance of those impacts were established during the construction period and the operational period of the project.
Project:	Emalahleni Development Agency
Year:	2022
Location:	Emalahleni Local Municipality
Client:	Advancities4Change
Project Features:	Establishment of a Development Agency
Position held:	Project Manager
Activities Performed:	Inception phase for the collection of available information, shift impact assessment to determine if an internal or external agency is needed for Emalahleni. The feasibility phase looked at the practical viability and financial feasibility of establishing an agency. The regulatory processes were followed in terms of the legislation guiding Development Agencies.
Project:	Mangweni Retail Feasibility Assessment
Year:	2023
Location:	Nkomazi Local Municipality - Mangweni
Client:	Impala Avenue
Project Features:	Market Feasibility Study
Position held:	Project Advisor
Activities Performed:	Inception phase for the collection of available information, shift impact assessment to determine if an internal or external agency is needed for Emalahleni. The feasibility phase looked at the practical viability and financial feasibility of establishing an agency. The regulatory processes were followed in terms of the legislation guiding Development Agencies.
Project:	ABO Wind Energy Complex SEIA
Year:	2023
Location:	Ermelo – Amersfoort, Mpumalanga
Client:	SiVest
Project Features:	Socio-Economic Impact Assessment
Position held:	Project Manager
Activities Performed:	Socio-Economic Impact Assessment to determine the social and economic impacts as a result of the establishment of two wind farms in the region of Amersfoort in Mpumalanga. The social and economic impacts were determined and the significance of those impacts were established during the construction period and the operational period of the project.
Project:	Malelane Private Hospital Verification Study
Year:	2022
Location:	Malelane, Nkomazi LM, Mpumalanga
Client:	RH Managers on behalf of DBSA
Project Features:	Hospital Demand and Verification Study
Position held:	Project Director
Activities Performed:	To conduct a hospital verification study. The study entailed the review of a hospital demand study, done by Fernridge in 2018. Urban-Econ then did an independent market demand study and then evaluated and compared the results with the initial study conducted in 2018 to verify any potential demand for a private hospital in the Malelane region of Mpumalanga.
Project:	Sol Plaatje Investment and Promotion Strategy
Year:	2022
Location:	Kimberley, Northern Cape, South Africa
Client:	South Hill Trading on behalf of Sol Plaatje LM
Project Features:	Incentive and Promotion Strategy
Position held:	Project Director
Activities Performed:	

	To develop an Investment and Promotion Strategy for the Sol Plaatje Municipality. The key focus area was the competitive advantages of the municipality in the regional economy, developing key investment projects, incentives and strategy. The strategic interventions included; creating an enabling environment, tourism promotion and development, transport and logistics development, trade and investment development and a key focus on local manufacturing development. The strategy was completed with a detailed investment promotion and implementation plan.
Project: Year: Location: Client: Project Features: Position held: Activities Performed:	Mutsho Solar PV Cluster Socio-Economic Impact Assessment 2022 Musina, Limpopo, South Africa Savannah Environmental Socio-Economic Impact Assessment (SEIA) Project Director Conducted a socio-economic impact assessment for 4 x 100MW solar PV facilities in the Musina region of Limpopo. The SEIA entailed the development of a baseline profile of the area, identification of the area of impact, engagement with interested and affected parties. The identification of impacts during construction and operational phases was determined and evaluated.
Project: Year: Location: Client: Project Features: Position held: Activities Performed:	Ermelo Ext 44 Market Assessment 2022 Ermelo, Mpumalanga, South Africa Sizampilo Projects Market Demand Assessment Project Director To determine the demand for residential housing within the Ermelo region. The study entailed the delineation of the study area, development of a socio-economic profile, demand modelling for residential market and the verification of social amenity needs for the large scale integrated residential development. The study also evaluated the retail and office markets witch will form part of the larger integrated development.
Project: Year: Location: Client: Project Features: Position held: Activities Performed:	Ehlanzeni DM LED Strategy and Economic Recovery Plan 2021 Ehlanzeni District, Mpumalanga, South Africa Ehlanzeni District Municipality Local Economic Development Strategy and Economic Recovery Plan Project Director To review the existing Local Economic Development Strategy and develop an economic recovery plan to combat the negative impact of Covid-19 on the local and regional economy. The review of the LED strategy includes an updated status quo, opportunity analysis as well as a strategic framework which forms the key component of the economic recovery plan for the district. An implementation plan with detailed actions and tasks was developed to allow for an effective implementation of the economic recovery plan.
Project: Year: Location: Client: Project Features: Position held: Activities Performed:	South Africa – Cuba Technical Support Programme (SACTSP) Evaluation 2020 South Africa National Department of Human Settlements (DHS) Programme Evaluation Project Manager To conduct an evaluation of the South Africa-Cuba Technical Support Programme (SACTSP). The SACTSP was initiated mainly to accelerate the implementation of Human Settlement development based on the Cuban experience and to improve the lives of the housing beneficiaries in South Africa. The evaluation was done on the programme to determine the effectiveness of the programme in delivering on the initial objectives of the programme. The programme evaluation determined the effectiveness of the project and made recommendations on how the programme can be improved.
Project: Year: Location: Client: Project Features: Position held:	Mpumalanga Red Tape Reduction Strategy 2020 Mpumalanga, South Africa Mpumalanga Department of Economic Development and Tourism (DEDT) Red Tape Reduction Strategy Project Manager

Activities Performed:	To develop a Red Tape Reduction Strategy which will provide targets for both the municipalities and the provincial departments to reduce bureaucracy and improve service delivery specifically on SMMEs. The project included a literature review of current policies and legislation that deals with the reduction of red tape, case studies and detailed interviews with the business sector and the governmental organisations dealing with Red Tape. Identification of Red Tape Processes and Systems and developing a strategy to reduce red tape processes and streamlining these systems.
Project: Year: Location: Client: Project Features: Position held: Activities Performed:	Steve Tshwete Mining Sector Analysis 2020 Steve Tshwete LM, Mpumalanga, South Africa Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) and Mpumalanga DEDT Comprehensive Mining Sector Analysis, Spatial Mapping and SLP Monitoring Mechanism Design Project Manager To conduct an analysis on the impact made by the social labour plans regarding their social responsibility within the Steve Tshwete Local Municipality boundaries. A detailed mining sector analysis in Steve Tshwete LM, including existing mines, SLP projects, mining rehabilitation, and spatial mapping. The project also includes recommendations/model for a better overall steering and monitoring for SLPs and CSR Projects
Project: Year: Location: Client: Project Features: Position held: Activities Performed:	Mpumalanga Steel and Metal Fabrication "Centre of Excellence" Business Plan 2019 Middelburg, Mpumalanga, South Africa Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) and Mpumalanga DEDT Feasibility Study and Business Plan Project Manager To develop a detailed feasibility study to test the viability of a steel and metal fabrication hub in Middelburg that will focus on incubation and skills development. The Centre of Excellence (CoE) also includes a high-tech testing centre and research and development lab. The market viability was tested, and opportunities identified in the stainless steel, aluminium and carbon steel markets. Once feasibility was determined a bankable business plan was developed for investment marketing, funding application and implementation.
Project: Year: Location: Client: Project Features: Position held: Activities Performed:	Role and Impact of the Informal Economy in Mpumalanga 2018 Mpumalanga, South Africa Mpumalanga Department of Economic Development and Tourism Economic Impact Study on the Informal Economy Project Manager To determine the role and impact of the informal economy in Mpumalanga. The study includes a literature review and case studies both local and international on the informal economy dynamics, future and contributions. The project also entailed a primary survey of 1000 informal business across the province though a statistical sampling using informal employment and economic contribution as criteria. The economic impact assessment determined the size of the economy and assisted with identifying opportunities and barriers that exist in the informal economy of Mpumalanga.
Project: Year: Location: Client: Project Features: Position held: Activities Performed	MMC Socio-Economic Impact Assessment and Value Determination 2018 Mpumalanga Manganese Metal Company (MMC) Economic Impact Assessment/Company Value Determination Project Manager Socio-Economic Impact assessment of the Manganese Metal Company, to determine the economic and social impact that the company has on the local economy and local communities. The study was done in order for MMC to submit to Eskom reasons for lower electricity tariffs as well as to NERSA.
Project: Year: Location: Client: Project Features: Position held: Activities Performed	Pole Treatment Plant Business Plan 2018/2019 Mpumalanga SAFCOL Feasibility Study/Business Plan Junior Development Economist

	Element 2030, in partnership with Urban-Econ Development Economists and Green Consulting Engineers, was appointed by SAFCOL (South African Forestry Company SOC Limited) to undertake a specialist market potential investigation for the development of a pole treatment plant in Mpumalanga. An important component of this study is to inform development and investment decisions relating to the envisioned development to optimise its industrial function and oversee the optimal use of available resources.
Project: Year: Location: Client: Project Features: Position held: Activities Performed	Chief Albert Luthuli LED Strategy 2018/2019 Mpumalanga Chief Albert Luthuli Local Municipality LED Strategy Project Manager Urban-Econ Development Economists have been appointed by the Chief Albert Luthuli Municipality to develop a Local Economic Development (LED) Strategy. LED involves identifying and using local resources, ideas and skills to stimulate economic growth and development. The aim of the LED Strategy is to create employment opportunities for local residents, alleviate poverty and redistribute resources and opportunities to the benefit of all local residents.
Project: Year: Location: Client: Project Features: Position held: Activities Performed:	Swaziland Mixed-Use Development 2018 Eswatini Stanlib Swaziland Market Feasibility Research and Demand Analysis Project Manager Conduct research to conclude if a mixed-use development would be feasible in the area of Manzini, Eswatini. The study includes a review in the economic dynamics and future contributions of a mixed-use development. The study reveals opportunities and barriers in local economic sectors. The project also entailed a statistical supply and demand analysis to determine the economic contribution to the local economies.
Project: Year: Location: Client: Project Features: Position held: Activities Performed	Business Plan for DR JS Moroka Hydroponic project 2018 Mpumalanga Department of Rural Development and Land Reform Business Plan Project Manager Urban-Econ was appointment by the Department of Rural Development and Land Reform to provide advisory services for two years; this includes the development of business plans for projects identified as potential funding beneficiaries. As part of the advisory services, Urban-Econ Development Economists was appointed to compile a bankable business plan for the proposed DR JS Moroka Hydroponic project.
Project: Year: Location: Client: Project Features: Position held: Activities Performed:	Greater Tzaneen Local Municipality LED Strategy 2017 Limpopo Greater Tzaneen Local Municipality LED Strategy Project Manager/Senior Development Economists The project entailed a situational analysis consisting of a thorough review of the socio-economic factors and the economic performance of the local municipality, together with a spatial analysis in order to identify new opportunities to generate economic growth and create employment opportunities within the local municipality. The Strategy outlines projects to be implemented to reach the identified goals, as well as an implementation plan.
Project: Year: Location: Client: Project Features: Position held:	Business Cases for Agri-Hubs and FPSUs in Mpumalanga 2016 – 2017 Mpumalanga Department of Rural Development and Land Reform Business Plan Project Manager/Senior Development Economist

	Element 2030, in partnership with Urban-Econ Development Economists and Green Consulting Engineers, was appointed by SAFCOL (South African Forestry Company SOC Limited) to undertake a specialist market potential investigation for the development of a pole treatment plant in Mpumalanga. An important component of this study is to inform development and investment decisions relating to the envisioned development to optimise its industrial function and oversee the optimal use of available resources.
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Project: Year: Location: Client: Project Features: Position held: Activities Performed	Chief Albert Luthuli LED Strategy 2018/2019 Mpumalanga Chief Albert Luthuli Local Municipality LED Strategy Project Manager Urban-Econ Development Economists have been appointed by the Chief Albert Luthuli Municipality to develop a Local Economic Development (LED) Strategy. LED involves identifying and using local resources, ideas and skills to stimulate economic growth and development. The aim of the LED Strategy is to create employment opportunities for local residents, alleviate poverty and redistribute resources and opportunities to the benefit of all local residents.
Project: Year: Location: Client: Project Features: Position held: Activities Performed:	Swaziland Mixed-Use Development 2018 Eswatini Stanlib Swaziland Market Feasibility Research and Demand Analysis Project Manager Conduct research to conclude if a mixed-use development would be feasible in the area of Manzini, Eswatini. The study includes a review in the economic dynamics and future contributions of a mixed-use development. The study reveals opportunities and barriers in local economic sectors. The project also entailed a statistical supply and demand analysis to determine the economic contribution to the local economies.
Project: Year: Location: Client: Project Features: Position held: Activities Performed	Business Plan for DR JS Moroka Hydroponic project 2018 Mpumalanga Department of Rural Development and Land Reform Business Plan Project Manager Urban-Econ was appointment by the Department of Rural Development and Land Reform to provide advisory services for two years; this includes the development of business plans for projects identified as potential funding beneficiaries. As part of the advisory services, Urban-Econ Development Economists was appointed to compile a bankable business plan for the proposed DR JS Moroka Hydroponic project.
Project: Year: Location: Client: Project Features: Position held: Activities Performed:	Greater Tzaneen Local Municipality LED Strategy 2017 Limpopo Greater Tzaneen Local Municipality LED Strategy Project Manager/Senior Development Economists The project entailed a situational analysis consisting of a thorough review of the socio-economic factors and the economic performance of the local municipality, together with a spatial analysis in order to identify new opportunities to generate economic growth and create employment opportunities within the local municipality. The Strategy outlines projects to be implemented to reach the identified goals, as well as an implementation plan.
Project: Year: Location: Client: Project Features: Position held:	Business Cases for Agri-Hubs and FPSUs in Mpumalanga 2016 – 2017 Mpumalanga Department of Rural Development and Land Reform Business Plan Project Manager/Senior Development Economist

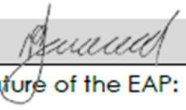
ANNEXURE C: SPECIALIST DECLARATION

1. DECLARATION OF THE SPECIALIST

Note: Duplicate this section where there is more than one specialist.

I PJ van Jaarsveld, as the appointed Specialist hereby declare/affirm the correctness of the information provided or to be provided as part of the application, and that:

- In terms of the general requirement to be independent:
  - other than fair remuneration for work performed in terms of this application, have no business, financial, personal or other interest in the development proposal or application and that there are no circumstances that may compromise my objectivity; or
  - am not independent, but another specialist (the "Review Specialist") that meets the general requirements set out in Regulation 13 of the NEMA EIA Regulations has been appointed to review my work (Note: a declaration by the review specialist must be submitted);
- In terms of the remainder of the general requirements for a specialist, have throughout this EIA process met all of the requirements;
- I have disclosed to the applicant, the EAP, the Review EAP (if applicable), the Department and I&APs all material information that has or may have the potential to influence the decision of the Department or the objectivity of any Report, plan or document prepared or to be prepared as part of the application; and
- I am aware that a false declaration is an offence in terms of Regulation 48 of the EIA Regulations.



14 December 2023
Signature of the EAP:	Date:

Urban-Econ Development Economists (Pty) Ltd
Name of company (if applicable):