

# **SOCIAL IMPACT ASSESSMENT**

## **INCA VREDENDAL SOLAR ENERGY FACILITY WESTERN CAPE PROVINCE**

**November 2011**

**Prepared for**

**SAVANNAH ENVIRONMENTAL (Pty) Ltd**

**By**

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# **EXECUTIVE SUMMARY**

## **INTRODUCTION AND LOCATION**

Savannah Environmental (Pty) Ltd was appointed by INCA Vredendal Solar (Pty) Ltd (a subsidiary of INCA Energy) as the lead consultants to manage the Environmental Impact Assessment (EIA) process for the establishment of the proposed INCA Vredendal Photovoltaic Solar Energy Facility (PVSEF) and associated infrastructure on a site located approximately 10 km north west of the town of Vredendal in the Western Cape Province.

Tony Barbour Consulting was appointed by Savannah Environmental (Pty) Ltd to undertake a specialist Social Impact Assessment (SIA) as part of the EIA process. The terms of reference for the study include a scoping level assessment followed by a detailed assessment of the social issues as part of the EIA. This report contains the findings of the Draft SIA undertaken as part of the EIA process.

## **DESCRIPTION OF THE PROPOSED SOLAR ENERGY FACILITY**

An area of approximately 100 ha is being considered for the construction of the photovoltaic solar energy facility. The proposed facility will accommodate an array of photovoltaic (PV) panels with a generating capacity of up to 30 MW.

Solar energy facilities, such as those using PV panels, use the energy from the sun to generate electricity through a process known as the Photovoltaic Effect. This effect refers to photons of light colliding with electrons, and therefore placing the electrons into a higher state of energy to create electricity. Solar PV facilities consist of the following components.

### **The Photovoltaic Cell**

A photovoltaic (PV) cell is made of silicone which acts as a semiconductor used to produce the photovoltaic effect. Individual PV cells are linked and placed behind a protective glass sheet to form a photovoltaic panel.

### **The Inverter**

The photovoltaic effect produces electricity in direct current. Therefore an inverter must be used to change it to alternating current.

### **The Support Structure**

The PV panels will be fixed to a support structure set at an angle so as to receive the maximum amount of solar radiation. The angle of the panel is dependent on the latitude of the proposed facility and the angles may be adjusted to optimise for summer or winter solar radiation characteristics. The PV panels are designed to operate continuously for more than 20 years, unattended and with low maintenance.

The basic infrastructure associated with the proposed INCA Vredendal PVSEF would include:

- PV solar panels with a generating capacity of ~ 30 MW;
- An on-site generator transformer and a small substation to facilitate the connection between the renewable energy facility and the Eskom electricity grid;

- Foundations to support the PV panels;
- Cabling between the project components, to be laid underground where practical;
- An overhead power line (66kV) of ~1.5 km in length feeding into the Eskom electricity network at the existing Juno Substation;
- Internal access roads; and,
- Workshop area for maintenance and storage.

## **APPROACH TO THE STUDY**

The approach to the SIA study is based on the Western Cape Department of Environmental Affairs and Development Planning Guidelines for Social Impact Assessment (February 2007). These guidelines are based on international best practice. The key activities in the SIA process embodied in the guidelines include:

- Describing and obtaining an understanding of the proposed intervention (type, scale, location), the communities likely to be affected and determining the need and scope of the SIA;
- Collecting baseline data on the current social environment and historical social trends;
- Identifying and collecting data on the key social issues related to the proposed development. This requires consultation with affected individuals and communities;
- Assessing and documenting the significance of social impacts associated with the proposed intervention;
- Identifying alternatives and mitigation measures.

In this regard the study involved:

- Review of demographic data from the 2001 Census Survey and other more recent data;
- Review of relevant planning and policy frameworks for the area;
- Site specific information collected during the site visit to the area and interviews with key stakeholders;
- Review of information from similar projects;
- Identification of social issues associated with the proposed project.

Due to the requirements for the generation of solar energy, no alternative sites were identified within the area. As such, the EIA does not assess any additional site alternatives for the project.

## **SUMMARY OF KEY FINDINGS**

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

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

The potential health impacts associated with PVSEF plants are also discussed.

## **POLICY AND PLANNING ISSUES**

The following key policy and planning documents were reviewed:

- The National Energy Act (2008);
- The White Paper on the Energy Policy of the Republic of South Africa (December 1998);
- The White Paper on Renewable Energy (November 2003);
- Integrated Resource Plan (IRP) for South Africa (2010-2030);
- White Paper on Sustainable Energy for the Western Cape (Final Draft, 2008);
- The Western Cape Draft Strategic Plan (2010);
- Climate Change Strategy and Action Plan for the Western Cape (2008).
- Western Cape Provincial Spatial Development Framework (2009);
- Western Cape Amended Zoning Scheme Regulations for the establishment of Commercial Renewable Energy Facilities (2011);
- Matzikama Integrated Development Plan (2007-2011);
- Matzikama Tourism Development Strategy (2010-2015).
- Matzikama Spatial Development Framework (2010).

The findings of the review indicate that solar energy is strongly supported at a national, provincial and local level. At a national level the White Paper on Energy Policy (1998) notes:

- Renewable resources generally operate from an unlimited resource base and, as such, can increasingly contribute towards a long-term sustainable energy future;
- The support for renewable energy policy is guided by a rationale that South Africa has a very attractive range of renewable resources, particularly **solar** and wind and that renewable applications are in fact the least cost energy service in many cases; more so when social and environmental costs are taken into account.

The IRP 2010 also allocates 43% of energy generation in South Africa to renewables. At a provincial level wind and solar are identified as suitable renewable energy options for the Western Cape. In this regard the 2009 Spatial Development Plan notes that 25% of the Province's energy generation should consist of renewables by 2020. It should also be noted that meeting the requirements outlined in the 2011 LUPO Regulations for REF's is mandatory (e.g. decommissioning/ rehabilitation fund; mitigation of disturbances, etc).

At a local level, the renewable energy sector is not explicitly identified as a sector or initiative in the current Matzikama Municipality (MM) policy and planning documents. However, the MM LED Manager indicated that the MM recognizes the potential benefits associated with the development of PVSEFs in the MM. These benefits include long term employment and training opportunities as well as potential benefits associated with contributions to a Community Development Trust / Fund that the MM are considering establishing (Philips – pers. comm).

The findings of the review of the relevant policies and documents pertaining to the energy sector therefore indicate that solar energy and the establishment of solar energy plants are supported at a national, provincial, and local level. It is therefore the opinion of the authors that the establishment of a PVSEF on the proposed site is supported by national, provincial and local policies and planning documents. However, the provincial and local policy and planning documents also make

reference to the importance of tourism and the regions natural resources. Care therefore needs to be taken to ensure that the development of large renewable energy projects, such as the proposed PVSEF, do not impact on the region's natural resources and the tourism potential of the Province.

## **CONSTRUCTION PHASE**

The key social issues associated with the construction phase include:

### **Potential positive impacts**

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

The construction phase is expected to extend over a period of 10-12 months and create approximately ~ 100 employment opportunities. It is anticipated that approximately 55 % (55) of the employment opportunities will be available to low skilled (construction labourers, security staff etc), 30 % (30) semi-skilled workers (drivers, equipment operators etc) and 15% (15) to skilled personnel (engineers, land surveyors, project managers etc). The majority of the employment opportunities, specifically the low and semi-skilled opportunities, are likely to be available to local residents in the area, specifically residents from the towns of Lutzville and Vredendal. The majority of the beneficiaries are likely to be historically disadvantaged (HD) members of the community. This would represent a significant positive social benefit in an area with limited employment opportunities. However, the low education and skills levels in the area will hamper potential opportunities for local communities.

The capital expenditure associated with the construction phase will be in the region of R 750 million (2011 rand value). The total wage bill for the 10-12 month construction phase will be in the region of R 10 million (2011 rand value). A percentage of this wage bill will be spent in the local economy which will benefit local businesses in Lutzville and Vredendal. The local service sector is also likely to benefit from the proposed development. The potential opportunities for the local service sector are linked to accommodation, catering, cleaning, transport and security, etc. associated with meeting the needs of the construction workers on the site. The benefits to the local economy will however be confined to the construction period (10-12 months).

The contractors appointed during the construction phase are also likely to provide on-site training and skills development opportunities. However, the majority of benefits are likely to accrue to personnel employed by the relevant contractors. In the absence of specific commitments from the developer to employ local contractors the potential for meaningful skills development and training for members from the local communities may be limited.

### **Potential negative impacts**

- Impacts associated with the presence of construction workers on site
- Influx of job seekers to the area;
- Loss of farm labour to the construction phase;
- Increased risk of stock theft, poaching and damage to farm infrastructure associated with presence of construction workers on the site
- Impact of heavy vehicles, including damage to roads, safety, noise and dust
- Potential loss of grazing land associated with construction-related activities.

The significance of the potential negative impacts with mitigation was assessed to be of Low significance. The majority of the potential negative impacts can therefore be effectively mitigated if the recommended mitigation measures are implemented. In addition, given that the majority of the low and semi-skilled construction workers can be sourced from the local area the potential risk to local family structures and social networks is regarded as low. However, the impact on individuals who are directly impacted on by construction workers and or job seekers (i.e. contract HIV/ AIDS) was assessed to be of Medium-High negative significance.

Table 1 summarises the significance of the impacts associated with the construction phase.

**Table 1: Summary of social impacts during construction phase**

<b>Impact</b>	<b>Significance No Mitigation</b>	<b>Significance With Mitigation</b>
<b>Creation of employment and business opportunities</b>	Medium (Positive impact)	Medium (Positive impact)
<b>Presence of construction workers and potential impacts on family structures and social networks</b>	Low (Negative impact for community as a whole) Medium-High (Negative impact of individuals)	Low (Negative impact for community as a whole) Medium-High (Negative impact of individuals)
<b>Influx of job seekers</b>	Low (Negative impact for community as a whole) Medium-High (Negative impact of individuals)	Low (Negative impact for community as a whole) Medium-High (Negative impact of individuals)
<b>Loss of farm labour</b>	Low (Negative impact)	Low (Negative impact)
<b>Risk of stock theft, poaching and damage to farm infrastructure</b>	Low (Negative impact)	Low (Negative impact)
<b>Impact of heavy vehicles and construction activities</b>	Low (Negative impact)	Low (Negative impact)
<b>Loss of farmland</b>	Medium (Negative impact)	Low (Negative impact)

## **OPERATIONAL PHASE**

The key social issues affecting the operational phase include:

### **Potential positive impacts**

- Creation of employment and business opportunities. The operational phase will also create opportunities for skills development and training;
- The establishment of infrastructure to generate renewable energy.

The total number of permanent employment opportunities is estimated to be in the region of 50. Of this total ~ 40 are low skilled, 8 semi-skilled and 2 skilled. The annual wage bill will be ~ R 4.2 million(2011 rand value). The majority of the

beneficiaries are therefore likely to be historically disadvantaged (HD) members of the community. Given the location of the proposed facility the majority of permanent staff is likely to reside in Lutzville and or Vredendal.

In terms of accommodation options, a percentage of the non-local permanent employees may purchase a house in one of these two towns, while others may decide to rent. Both options would represent a positive economic benefit for the region. In addition, a percentage of the monthly wage bill earned by permanent staff would be spent in the local economy. The benefits to the local economy will extend over the 25-30 year operational lifespan of the project.

The establishment of a number of renewable energy facilities, including PVSEFs, in the Matzikama region will also create significant economic opportunities for the area. The significance of this impact is rated as High Positive. In this regard it is recommended that the MM investigate the Community Development Trust / Fund model developed by the Theeswaterskloof LM in the Western Cape. The model developed by the Theeswaterskloof LM requires all potential renewable energy operators to contribute to a Community Development Trust / Fund. In terms of the structure of the Trust, a percentage of the revenue from the renewable energy operations is allocated to projects identified in the Theeswaterskloof IDP. Of this total, 50% of the revenue is allocated to infrastructure projects and the remaining 50% to social projects and initiatives, such as skills development and training. The Matzikama LED manager indicated that the option of establishing such a fund was being investigated.

The proposed development also represents an investment in infrastructure for the generation of clean, renewable energy, which, given the challenges created by climate change, represents a Positive High social benefit for society as a whole.

#### **Potential negative impacts**

- Influx of job seekers to the area;
- Loss of farm workers to jobs associated with the operational phase;
- The visual impacts and associated impact on sense of place;
- Potential impact on tourism.

The significance of the potential negative impacts with mitigation was assessed to be of Low significance. The majority of the potential negative impacts can therefore be effectively mitigated if the recommended mitigation measures are implemented. However, the impact on individuals who are directly impacted on by job seekers (i.e. contract HIV/ AIDS) was assessed to be of Medium-High negative significance.

The visual impacts on landscape character associated with large renewable energy facilities, such as PVSEFs, are highlighted in the research undertaken by Warren and Birnie (2009). In the South African context, the majority of South Africans have a strong connection with and affinity for the large, undisturbed open spaces that are characteristic of the South African landscape. The impact of large, solar energy plants on the landscape is therefore likely to be a key issue in South Africa, specifically given South African's strong attachment to the land and the growing number of solar energy applications. However, in the case of the proposed INCA Vredendal PVSEF, the visual integrity of the site has been impacted by the existing power related infrastructure associated with the Juno substation, which is located in close proximity to the site.

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

**Table 2: Summary of social impacts during operational phase**

<b>Impact</b>	<b>Significance No Mitigation</b>	<b>Significance With Mitigation</b>
<b>Creation of employment and business opportunities</b>	Medium (Positive impact)	High (Positive impact)
<b>Promotion of renewable energy projects</b>	Medium (Positive impact)	Medium (Positive impact)
<b>Influx of job seekers</b>	Low (Negative impact for community as a whole) Medium-High (Negative impact of individuals)	Low (Negative impact for community as a whole) Medium-High (Negative impact of individuals)
<b>Loss of farm labour</b>	Low (Negative)	Low (Negative)
<b>Impact on productive agricultural land</b>	Medium (Negative impact)	Low (Negative impact)
<b>Visual impact and impact on sense of place</b>	Medium (Negative impact)	Medium (Negative impact)
<b>Impact on tourism</b>	Low (Positive and Negative)	Low (Positive and Negative)

### **Cumulative impacts**

The cumulative impacts associated with solar energy facilities, such as the proposed INCA Vredendal PVSEF, are largely linked to visual impacts and the related impact on sense of place and landscape character. In the case of the proposed INCA Vredendal PVSEF the significance of the potential cumulative social impacts, specifically the impact on landscape character, was rated to be low. This is due to the impact of the Juno substation and associated energy related infrastructure.

However, it is recommended that the environmental authorities consider the overall cumulative impact on the rural character and the areas sense of place before a final decision is taken with regard to the optimal number of PVSEFs in the area. In addition, the siting and number of individual components of the plant should be informed by findings of the relevant VIAs, specifically with respect to the visual impact on farmsteads and important roads in the area.

In addition to the potential negative impacts, the proposed INCA Vredendal PVSEF also has the potential to result in significant positive cumulative impacts, specifically given the establishment of a number of renewable energy facilities in Matzikama area. This will create a number of socio-economic opportunities for MM, which, in turn, will result in a positive social benefit. The positive cumulative impacts include creation of employment, skills development and training opportunities, creation of downstream business opportunities and stimulation of the local property market.

### **Power lines**

The findings of the SIA indicate that the impacts associated with the proposed overhead power lines linking the site to the Juno substation will be low.

### **Potential health impacts**

The primary environmental, health, and safety issues associated with solar energy involve how they are manufactured, installed, and ultimately disposed of. In particular, the manufacturing of photovoltaic cells often requires hazardous materials such as arsenic and cadmium. Even relatively inert silicon, a major material used in solar cells, can be hazardous to workers if it is breathed in as dust. Workers involved in manufacturing photovoltaic modules and components must consequently be protected from exposure to these materials. However, none of these potential hazards is much different in nature and or magnitude from the innumerable hazards people face routinely in an industrial society. Through effective regulation, the dangers can very likely be kept at a very low level. In addition, the relevant risks essentially concern workers at the cell manufacturing plant and therefore fall outside the scope of the EIA.

### **No-development option**

The No-Development option would represent a lost opportunity for South Africa to supplement its current energy needs with clean, renewable energy. Given South Africa's position as one of the highest per capita producer of carbon emissions in the world, this would represent a High negative social cost. The no-development option also represents a lost opportunity in terms of the employment and business opportunities (construction and operational phase) associated with the proposed PVSEF. This also represents a negative social cost.

However, at a provincial and national level, it should be noted that the INCA PVSEF development proposal is not unique. In that regard, a significant number of WEF developments are currently proposed in the Western and Eastern Cape Provinces. Foregoing the proposed INCA Vredendal PVSEF development would therefore not necessarily compromise the development of renewable energy facilities in the Western Cape or South Africa.

### **Decommissioning**

Typically, the major social impacts associated with the decommissioning phase are linked to the loss of jobs and associated income. This has implications for the households who are directly affected, the communities within which they live, and the relevant local authorities. However, in the case of the PVSEFs decommissioning phase is likely to involve the disassembly and replacement of the existing components with more modern technology. This is likely to take place in the 25-30 years post commissioning. The decommissioning phase is therefore likely to create additional, construction type jobs, as opposed to the jobs losses typically associated with decommissioning.

Given the relatively small number of people employed during the operational phase (~ 50), the decommissioning of the facility will have a limited negative social impact on the local community. In addition, the potential impacts associated with the decommissioning phase can also be effectively managed with the implementation of a retrenchment and downscaling programme. With mitigation, the impacts are assessed to be Low (negative).

INCA Energy should also investigate the option of establishing an Environmental Rehabilitation Trust Fund to cover the costs of decommissioning and rehabilitation of disturbed areas. The Trust Fund should be funded by a percentage of the revenue generated from the sale of energy to the national grid over the 25-30 year

operational life of the facility. The rationale for the establishment of a Rehabilitation Trust Fund is linked to the experiences with the mining sector in South Africa and failure of many mining companies to allocate sufficient funds during the operational phase to cover the costs of rehabilitation and closure. The 2011 LUPO Regulations also require that decommissioning activities should include the removal of all REF structures, as well as transmission lines, the disposal of solid and hazardous waste and the stabilization and re-vegetation of the site. The LUPO provisions are mandatory. It is assumed that INCA will implement the relevant measures.

## **RECOMMENDATIONS**

The findings of the SIA indicate that the development of the proposed INCA Vredendal PVSEF will create employment and business opportunities for locals during both the construction and operational phase of the project. The mitigation measures listed in the report should be implemented in order to enhance them. In addition, the proposed establishment of a number of renewable energy facilities in the Matzikama region will create socio-economic opportunities, which, in turn, will result in a positive social benefit. The significance of this impact is rated as High Positive.

INCA Energy, in consultation with the Matzikama Municipality, should also investigate the opportunities for establishing a Community Development Trust / Fund that is linked to other proposed renewable energy projects in the area. The revenue for the trust / fund would be derived from the income generated from the sale of energy from the plant. The Community Trust / Fund should be linked to funding and supporting projects and initiatives identified in the Matzikama IDP. The mitigation measures listed in the report to address the potential negative impacts during the construction phase should also be implemented.

The proposed development also represents an investment in clean, renewable energy infrastructure, which, given the challenges created by climate change, represents a positive social benefit for society as a whole. The establishment of the proposed INCA Vredendal PVSEF is therefore supported by the findings of the SIA.

However, the potential impacts associated with large, solar energy facilities on an area's sense of place and landscape cannot be ignored. These impacts are an issue that will need to be addressed by the relevant environmental authorities, specifically given the large number of applications for solar facilities in the area.

## **IMPACT STATEMENT**

The findings of the SIA undertaken for the proposed INCA Vredendal PVSEF indicate that the development will create employment and business opportunities for locals during both the construction and operational phase of the project. In addition, the visual integrity of the site has been impacted by the existing power related infrastructure associated with the Juno substation. It is therefore recommended that the facility as proposed be supported, subject to the implementation of the recommended mitigation measures and management actions contained in the report.

## ACRONYMS

CBO	Community-based Organization
CPV	Concentrator Photovoltaic
CSI	Corporate Social Investment
DEA&DP	Department of Environmental Affairs and Development Planning (Western Cape)
DoA	Department of Agriculture
DoE	Department of Energy (National)
EIA	Environmental Impact Assessment
GW	Gigawatt
IDP	Integrated Development Plan
IPP	Independent Power Producer
IRP	Integrated Resource Plan
kV	Kilovolts
LED	Local Economic Development
LUPO	Land Use Planning Ordinance (Western Cape)
MF	Monitoring Forum
MM	Matzikama Local Municipality
MTGS	Matzikama Tourism Growth Strategy
Mtoe	Million tonnes of oil equivalent
MW	Megawatt
NGO	Non-governmental Organization
PGWC	Provincial Government Western Cape
PVSEF	Photovoltaic Solar Energy Facility
RBS	Revised Balanced Scenario
REF	Renewable Energy Facility
SDF	Spatial Development Framework
SEF	Solar Energy Facility
SIA	Social Impact Assessment
WCDCM	West Coast District Municipality
WCDCSP	Western Cape Draft Strategic Plan
WCMA	Western Cape Municipal Area
WEF	Wind Energy Facility

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## **SECTION 1: INTRODUCTION**

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### **1.1 INTRODUCTION**

INCA Vredendal Solar (Pty) Ltd (a subsidiary of INCA Energy) is proposing the establishment of a Photovoltaic Solar Energy Facility (PVSEF) with a maximum generation capacity of 30 MW on a site located approximately 10 km north-west of Vredendal in the Western Cape Province of South Africa.

Tony Barbour Consulting was appointed by Savannah Environmental (Pty) Ltd to undertake a specialist Social Impact Assessment (SIA) on behalf of INCA Vredendal Solar (Pty) Ltd as part of an Environmental Impact Assessment (EIA) application process currently being undertaken with regard to the proposed INCA Vredendal PVSEF.

### **1.2 TERMS OF REFERENCE**

The terms of reference for the SIA require:

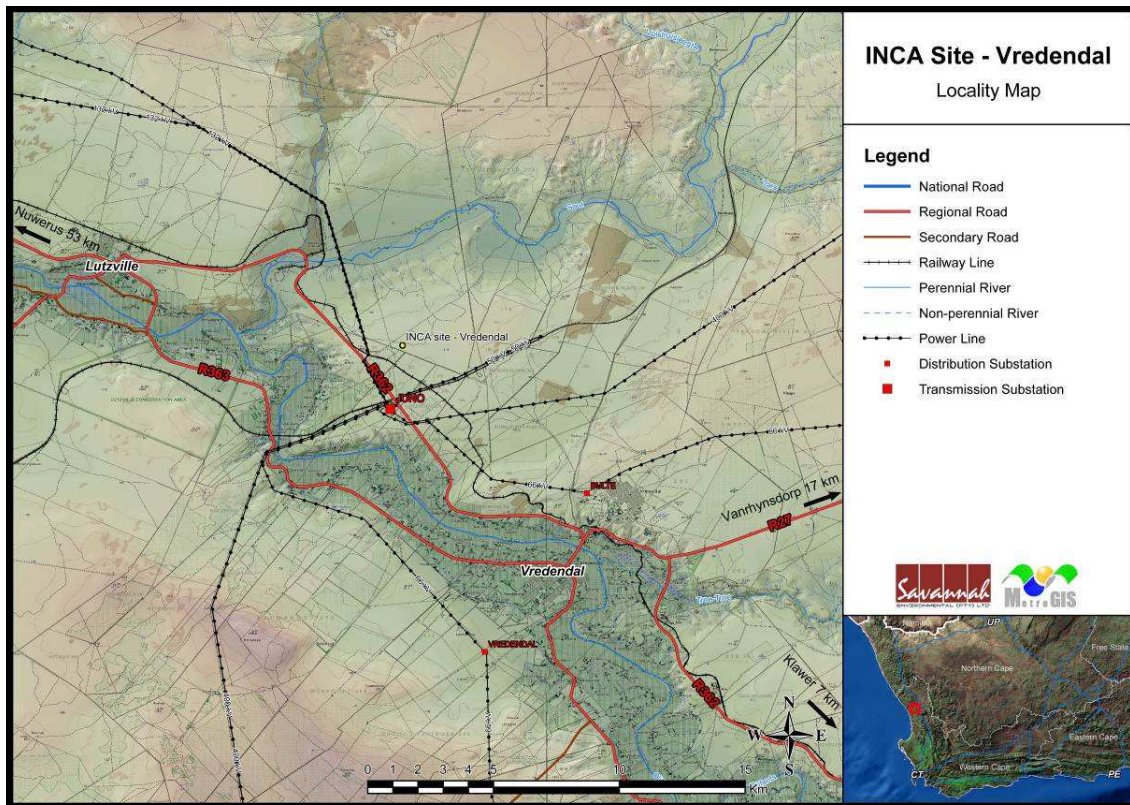
- A description of the environment that may be affected by the activity and the manner in which the environment may be affected by the proposed upgrade;
- A description and assessment of the potential social issues associated with the proposed upgrade;
- Identification of enhancement and mitigation aimed at maximizing opportunities and avoiding and or reducing negative impacts.

### **1.3 PROJECT DESCRIPTION**

INCA has identified the potential to establish a 30 MW PVSEF facility near the town of Vredendal in the Western Cape Province. The energy will be fed into the Eskom grid, and the project is therefore an Independent Power Producer (IPP) project. The proposed site is located approximately 10 km to the north-west and 10 km east of the towns of Vredendal and Lutzville respectively. The site is located on a single cadastral portion, viz. Remainder of Farm 277 (Seekoeigat) (Figure 1.1).

An area of approximately 100 ha is being considered for the establishment of the PVSEF and associated infrastructure. The exact number and placement of photovoltaic cells and arrays will be finalized based on the outcome of the EIA. Construction is proposed in a single phase.

Photovoltaic (PV) solar energy facilities use solar energy to generate electricity through a process known as the Photovoltaic Effect. This effect refers to photons of light colliding with electrons, and therefore placing the electrons into a higher state of energy to create electricity.



**Figure 1.1: Location of the proposed INCA Photovoltaic Solar Energy facility**

Solar PV facilities comprise of the following components:

### **The Photovoltaic Cell**

A photovoltaic (PV) cell is made of silicone which acts as a semiconductor used to produce the photovoltaic effect. Individual PV cells are linked and placed behind a protective glass sheet to form a photovoltaic panel.

### **The Inverter**

The photovoltaic effect produces electricity in direct current. Therefore an inverter must be used to change it to alternating current.

### **The Support Structure**

The PV panels will be fixed to a support structure set at an angle so to receive the maximum amount of solar radiation. The angle of the panel is dependent on the latitude of the proposed facility and the angles may be adjusted to optimize for summer or winter solar radiation characteristics. The PV panels are designed to operate continuously for more than 20 years, unattended and with low maintenance.

The basic infrastructure associated with proposed INCA Vredendal PVSEF facility includes:

- An on-site generator transformer and a small substation to facilitate the connection between the renewable energy facility and the Eskom electricity grid;
- Foundations to support the PV panels;
- Cabling between the project components, to be lain underground where practical;

- An overhead power line (66kV) of ~1.5 km in length feeding into the Eskom electricity network at the existing Juno Substation;
- Internal access roads; and,
- Workshop area for maintenance and storage.

The capital expenditure associated with the construction phase will be ~ R 750 million (2011 rand value). The construction phase will create approximately 100 employment opportunities and extend over 10-12 months. The total wage will be ~ R 10 million (2011 rand value). The operational phase will create approximately 50 employment opportunities.

The overall aim of the design and layout of the facility is to maximize electricity production through exposure to the solar radiation, while minimizing infrastructure, operation and maintenance costs, and social and environmental impacts. The use of solar energy for power generation can be described as a non-consumptive use of natural resources which emits zero greenhouse gas emissions. The generation of renewable energy contributes to South Africa's emerging renewables electricity generating market which has traditionally been dominated by coal-based power generation.

The proposed PVSEF would evacuate into the grid via the existing Juno substation, located ~1.5 km south of the site. The transmission line will traverse land that is currently used for sheep farming purposes, and would need to traverse the R262 just to the north of Juno. The sense of place of the area is affected by a number of transmission and distribution lines associated with the Juno substation as well as the Sishen-Saldanha railway line and associated bridge across the R362.

#### **1.4 ALTERNATIVES**

The no development alternative is the only alternative being assessed. The "no development" alternative entails leaving the existing status quo unchanged. Potential negative impacts would therefore be avoided, but at the same time potential benefits to local communities and society would be forfeited.

#### **1.5 OTHER RENEWABLE PROJECTS IN THE STUDY AREA**

Information provided by planners from the Mazikama Municipality (MM) indicates that approximately 10 renewable energy project proposals are currently proposed within the MM area. Two of these are solar projects, namely, INCA Vredendal and Solaire Direct's 10MW SEF, located 5-10 km south-east of the INCA site, near Vredendal North. The Solaire Direct's SEF has been approved. The other 8 renewable projects are wind farms.

#### **1.6 APPROACH TO STUDY**

The approach to the SIA study is based on the Western Cape Department of Environmental Affairs and Development Planning Guidelines for Social Impact Assessment (February 2007). These guidelines are based on international best practice. The key activities in the SIA process embodied in the guidelines include:

- Describing and obtaining an understanding of the proposed intervention (type, scale, location), the communities likely to be affected and determining the need and scope of the SIA;
- Collecting baseline data on the current social environment and historical social trends;
- Identifying and collecting data on the social issues related to the proposed intervention. This requires consultation with affected individuals and communities;
- Assessing and documenting the significance of social impacts associated with the proposed intervention;
- Identifying alternatives and mitigation measures.

In this regard the study involved:

- Review of demographic data from the 2001 Census Survey and other relevant data sources;
- Review of relevant planning and policy frameworks for the area;
- Site specific information collected during the site visit to the area and interviews with key stakeholders;
- Review of information from similar projects;
- Identification of social issues associated with the proposed project.

Due to the requirements for the generation of solar energy, no alternative sites were identified within the area. As such, the EIA does not assess any additional site alternatives for the project.

Annexure A contains a list of sources consulted for this social study. The methodology which was used in the Social Assessment presented in Section 5 is outlined in Annexure B of this SIA Report.

## **1.7 ASSUMPTIONS AND LIMITATIONS**

### **1.7.1 Assumptions**

#### **Identification of area for the solar energy facility**

It is assumed that the development site identified by INCA represents a technically suitable site for the establishment of a PVSEF.

#### **Strategic importance of the project**

The strategic importance of promoting solar energy is supported by the national and provincial energy policies.

### **1.7.2 Limitations**

#### **Demographic data**

The demographic data used in the study is largely based on the findings of the 2001 Census, or on sources based projections on the Census 2001 data. The writing of this report coincides with Census 2011 – the first comprehensive community level count undertaken since 2001. An interim Community Survey was undertaken by Statssa in 2007 (Local Municipal level). However, Census 2001 remains the most recent community/ ward level, actual count data currently available. Final data from Census

2011 will be available in early 2013. Therefore, it should be noted that the 2001 Census data is dated. Where possible this data has been up-dated.

## **1.8 REPORT STRUCTURE**

The report is divided into five sections, namely:

- Section 1: Introduction;
- Section 2: Overview of key applicable policy and planning documents;
- Section 3: Overview of key social baseline information;
- Section 4: Identification and assessment of key social issues;
- Section 5: Summary of key findings and recommendations.

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## SECTION 2: POLICY AND PLANNING CONTEXT

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### 2.1 INTRODUCTION

Legislation and policy embody and reflect key societal norms, values and developmental goals. The legislative and policy context therefore plays an important role in identifying, assessing and evaluating the significance of potential social impacts associated with any given proposed development. An assessment of the “policy and planning fit<sup>1</sup>” of the proposed development therefore constitutes a key aspect of the Social Impact Assessment (SIA). In this regard, assessment of “planning fit” conforms to international best practice for conducting SIAs. Furthermore, it also constitutes a key reporting requirement in terms of the applicable Western Cape Department of Environmental Affairs and Development Planning’s *Guidelines for Social Impact Assessment* (2007).

Section 2 provides an overview of the policy and planning environment affecting the proposed PV facility. For the purposes of the meeting the objectives of the EIA the following policy and planning documents were reviewed, namely:

- The National Energy Act (2008);
- The White Paper on the Energy Policy of the Republic of South Africa (December 1998);
- The White Paper on Renewable Energy (November 2003);
- Integrated Resource Plan (IRP) for South Africa (2010-2030);
- White Paper on Sustainable Energy for the Western Cape (Final Draft, 2008);
- The Western Cape Draft Strategic Plan (2010);
- Climate Change Strategy and Action Plan for the Western Cape (2008).
- Western Cape Provincial Spatial Development Framework (2009);
- Western Cape Amended Zoning Scheme Regulations for the establishment of Commercial Renewable Energy Facilities (2011);
- Matzikama Integrated Development Plan (2007-2011);
- Matzikama Tourism Development Strategy (2010-2015).
- Matzikama Spatial Development Framework (2010).

The section also provides a summary some of the key social issues associated with solar facilities based on international experience.

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

## **2.2 NATIONAL LEVEL ENERGY POLICY**

### **2.2.1 National Energy Act (Act No 34 OF 2008)**

The National Energy Act was promulgated in 2008 (Act No 34 of 2008). One of the objectives of the Act was to promote diversity of supply of energy and its sources. In this regard, the preamble makes direct reference to renewable resources, including solar:

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

### **2.2.2 The National White Paper on Renewable Energy (2003)**

This White Paper on Renewable Energy (further referred to as the White Paper) supplements the *White Paper on Energy Policy* (1998), which had recognized the significant medium and long-term potential of renewable energy. The 2003 White Paper sets out Government's vision, policy principles, strategic goals and objectives for promoting and implementing renewable energy in South Africa.

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

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

Government's long-term goal is the establishment of a renewable energy industry producing modern energy carriers that will offer in future years a sustainable, fully non-subsidized alternative to fossil fuels. The medium-term (10-year) target set in the White Paper is:

*10 000 GWh (0.8 Mtoe) renewable energy contribution to final energy consumption by 2013, to be produced mainly from biomass, wind, **solar** and small-scale hydro. The renewable energy is to be utilized for power generation and non-electric technologies such as solar water heating and bio-fuels. This is approximately 4% (1667 MW) of the projected electricity demand for 2013 (41539 MW) (Executive Summary, ix).*

### **2.2.3 National Integrated Resource Plan for Electricity (2010-2030)**

The current iteration of the Integrated Resource Plan (IRP) for South Africa, initiated by the Department of Energy (DoE) after a first round of public participation in June 2010, led to the Revised Balanced Scenario (RBS) that was published in October 2010. The document outlines the proposed generation new build fleet for South Africa for the period 2010 to 2030. This scenario was derived based on the cost-optimal solution for new build options (considering the direct costs of new build power plants), which was then "balanced" in accordance with qualitative measures such as local job creation. In addition to all existing and committed power plants, the

RBS included a nuclear fleet of 9,6 GW; 6,3 GW of coal; 11,4 GW of renewables; and 11,0 GW of other generation sources.

A second round of public participation was conducted in November/December 2010, which led to several changes to the IRP model assumptions. The main changes were the disaggregation of renewable energy technologies to explicitly display solar photovoltaic (PV), concentrated solar power (CSP) and wind options; the inclusion of learning rates, which mainly affected renewables; and the adjustment of investment costs for nuclear units, which until then represented the costs of a traditional technology reactor and were too low for a newer technology reactor (a possible increase of 40%).

Additional cost-optimal scenarios were generated based on the changes. The outcomes of these scenarios, in conjunction with the following policy considerations, led to the Policy-Adjusted IRP:

- The installation of renewables (solar PV, CSP and wind) were brought forward in order to accelerate a local industry;
- To account for the uncertainties associated with the costs of renewables and fuels, a nuclear fleet of 9,6 GW was included in the IRP;
- The emission constraint of the RBS (275 million tons of carbon dioxide per year after 2024) was maintained;
- Energy efficiency demand-side management (EEDSM) measures were maintained at the level of the RBS.

**Table 2.1 National Energy Development Commitments before the next IRP**

	New build options								
	Coal (PF, FBC, imports, own build)	Nuclear	Import hydro	Gas – CCGT	Peak – OCGT	Wind	CSP	Solar PV	
	MW	MW	MW	MW	MW	MW	MW	MW	MW
2010	0	0	0	0	0	0	0	0	0
2011	0	0	0	0	0	0	0	0	0
2012	0	0	0	0	0	0	0	0	300
2013	0	0	0	0	0	0	0	0	300
2014	500 <sup>1</sup>	0	0	0	0	400	0	0	300
2015	500 <sup>1</sup>	0	0	0	0	400	0	0	300
2016	0	0	0	0	0	400	100	0	300
2017	0	0	0	0	0	400	100	0	300
2018	0	0	0	0	0	400 <sup>4</sup>	100 <sup>4</sup>	0	300 <sup>4</sup>
2019	250	0	0	237 <sup>2</sup>	0	400 <sup>4</sup>	100 <sup>4</sup>	0	300 <sup>4</sup>
2020	250	0	0	237 <sup>2</sup>	0	400	100	0	300
2021	250	0	0	237 <sup>2</sup>	0	400	100	0	300
2022	250	0	1 143 <sup>2</sup>	0	805	400	100	0	300
2023	250	1 600	1 183 <sup>2</sup>	0	805	400	100	0	300
2024	250	1 600	283 <sup>2</sup>	0	0	800	100	0	300
2025	250	1 600	0	0	805	1 600	100	0	1 000
2026	1 000	1 600	0	0	0	400	0	0	500
2027	250	0	0	0	0	1 600	0	0	500
2028	1 000	1 600	0	474	690	0	0	0	500
2029	250	1 600	0	237	805	0	0	0	1 000
2030	1 000	0	0	948	0	0	0	0	1 000
<b>Total</b>	<b>6 250</b>	<b>9 600</b>	<b>2 609</b>	<b>2 370</b>	<b>3 910</b>	<b>8 400</b>	<b>1 000</b>	<b>0</b>	<b>8 400</b>

Firm commitment necessary now  
 Final commitment in IRP 2012

1. Built, owned & operated by IPPs 2. Commitment necessary due to required high-voltage infrastructure, which has long lead time 3. Commitment necessary due to required gas infrastructure, which has long lead time 4. Possibly required grid upgrade has long lead time and thus makes commitment to power capacity necessary

**Source: Integrated Resource Plan (IRP) for South Africa (2010)**

Table 2.1 above indicates the new capacities of the Policy commitment. The dates shown in Table 2.1 indicate the latest that the capacity is required in order to avoid security of supply concerns. The document notes that projects could be concluded earlier than indicated.

The Policy-Adjusted IRP includes the same amount of coal and nuclear new builds as the RBS, while reflecting recent developments with respect to prices for renewables. In addition to all existing and committed power plants (including 10 GW committed coal), the plan includes 9,6 GW of nuclear; 6,3 GW of coal; 17,8 GW of renewables; and 8,9 GW of other generation sources. The Policy-Adjusted IRP has therefore resulted in an increase in the contribution from renewables from 11,4 GW to 17,8 GW.

The key recommendations contained in the Policy-Adjusted IRP Final Report (March 2011) that have a bearing on the renewable energy sector include:

### **General**

- The dark shaded projects in Table 2.1 need to be decided before the next IRP iteration, with the identified capacities thereafter assumed as "committed" projects;
- The light shaded options should be confirmed in the next IRP iteration;
- All non-shaded options could be replaced during the next, and subsequent, IRP iterations if IRP assumptions change and thus impact on the quantitative model results.

### **PV Solar energy**

- Solar PV programme 2012-2015: In order to facilitate the connection of the first solar PV units to the grid in 2012 a firm commitment to this capacity is necessary. Furthermore, to provide the security of investment to ramp up a sustainable local industry cluster, the first four years from 2012 to 2015 require firm commitment;
- Solar PV 2016 to 2019: Grid upgrades might become necessary for the second round of solar PV installations from 2016 to 2019, depending on their location. To trigger the associated tasks in a timely manner, a firm commitment to these capacities is necessary in the next round of the IRP at the latest. By then, the assumed cost decreases for solar PV will be confirmed.

### **Conclusions**

The key conclusions that are relevant to the renewable energy sector include:

- An accelerated roll-out of renewable energy options should be allowed in order to derive the benefits of localisation in these technologies;
- A solar PV programme as envisaged in the Policy-Adjusted IRP should be pursued (including decentralised generation).

## **2.3 PROVINCIAL LEVEL POLICY AND PLANNING**

### **2.3.1 Provincial White Paper on Sustainable Energy for the Western Cape (Final Draft, 2008)**

The White Paper on Sustainable Energy compliments the Climate Change Strategy and Action Plan (see 2.2.5. below), specifically by in terms of setting targets for renewable energy generation. The White Paper is currently in Final Draft form. Once approved by Provincial cabinet, it will constitute the formal Western Cape's policy document on which the Western Cape Sustainable Energy Facilitation Bill will be based. The purpose of the White Paper and the envisaged Bill is to create an enabling policy environment in the Western Cape in order to promote and facilitate energy generation from renewable sources, as well as efficient energy use technologies and initiatives.

The White Paper forms part of PGWC's strategy to aimed at removing a number of barriers (e.g. energy pricing, legal, institutional, low levels of investment confidence, insufficient knowledge) currently frustrating the province's energy goals by preventing the adoption and commercialization of clean energy (including electricity generation from renewable sources such as wind and solar) technologies and initiatives. The White Paper notes that, with regard to sources of renewable energy, wind and solar both represent commercially viable options in the province. The document proposes that special focus should be given to these renewables subsectors and specific associated technologies in particular in order to achieve critical mass of installation, and thus drive down establishment costs and ensure permanent employment opportunities.

In terms of targets, the PGWC agreed to targets for electricity from renewable sources and for energy efficiency to be achieved by 2014. Of these, two are of direct relevance to the proposed INCA Vredendal PVSEF:

- Target for electricity generated from renewable sources: *15% of the electricity consumed in the Western Cape will come from renewable energy sources in 2014, measured against the 2006 provincial electricity consumption (p. 21)*
- Target for reducing carbon emissions: *The carbon emissions are reduced by 10% by 2014 measured against the 2000 emission levels (p. 23).*

### **2.3.2 Provincial Climate Change Strategy and Action Plan for the Western Cape (2008)**

The Climate Change Strategy and Action Plan (Final Draft, December 2008) is aligned with the Western Cape Sustainable Development Strategy, and gives expression to Provincial Government of the Western Cape's (PGWC) acknowledgement that the Western Cape will inevitably be affected by climate change, and thus needs to timeously set in place a sound foundation for future climate change responses in the province.

The document consists of two sections. The first section examines climate change and socio-economic factors in the Western Cape, and establishes the need for a climate change response in the region. The second section outlines the key aspects of the Western Cape's response strategy.

Key points of specific relevance to the proposed Vredendal PVSEF include:

### **The need for a climate change response in the Western Cape**

- South Africa is currently ranked as the 19<sup>th</sup> greatest emitter of greenhouse gasses (absolute terms) in the world;
- While the Western Cape's local direct emissions are relatively low, this is largely the result of the province importing most of its electricity (~90%), mainly from Mpumalanga;
- There is little doubt that the Western Cape will experience the effects of human-induced climate change in the near future, possibly as early as 2030. Current predictions indicate that the Western Cape will generally become hotter and drier. Predictions indicate a mean increase in temperature of at least 1 °C by 2050. Higher mean temperatures will have negative consequences for rainfall (frequency, amount) as well as the soil's ability to retain moisture. Periods of drought are anticipated to become more frequent and intense. Drier, hotter conditions will also increase the risk of more frequent, more severe fires;
- Predicted hotter and drier conditions hold significant risks to the Province's key economic sectors and associated livelihoods. Compromised growing conditions and less water available for irrigation will negatively affect the agricultural sector – with massive negative implications for the regional economy, employment as well as regional food security. Increased sea surface temperatures will likely impact negatively on fish stocks. The tourism sector is likely to suffer from changes in the landscape amenity;
- For these reasons the province need to be committed to doing its share to stabilize or reverse the current trend in global warming;
- With regard to the current situation, the Western Cape's energy infrastructure has demonstrated its reduced capacity to sustain cumulative impacts. The failure in supply of high quality energy that the province relies on, has high social and economic costs, as most of it needs to be imported from coal-burning power stations over very long distances;
- In terms of the Kyoto Protocol, South Africa, as a developing nation, does not have to take active steps to mitigate its carbon emissions. However, valuable export markets in the European Union are already starting to impose carbon emission reduction targets on their suppliers. The Western Cape, whose important agricultural sector is to a large extent export-orientated (wine, fruit) stands to lose market share on agricultural goods, for example, if no attempt is to be made to achieve at least carbon neutrality (no net emission of carbon for a produced good).

### **Response strategy and action plan**

- The Province's response strategy and associated action plan is based on two thrusts, namely adaptation and mitigation;
- Four programmes are prioritised. Of specific significance to the development of renewable energy resources, the reduction of the province's carbon footprint is identified as the key mitigatory response. Associated strategies include promotion of energy efficiency (including demand management), the development of renewable and alternate sustainable energy resources, effective waste management strategies, and cleaner fuel programmes for households and transport;
- Solar and wind energy are identified as the most suitable renewable technologies for the Western Cape. No resource development targets are set in the Climate Change Strategy document.

### **2.3.3 Western Cape Draft Strategic Plan (2010)**

Indications are that the Western Cape (Draft) Strategic Plan ("Delivering the Open Opportunity Society for All") is set to replace the 2008 *Ikapa Elihlumayo* (Provincial Growth and Development) strategy as the Province's overarching strategic plan for achieving economic growth, social equity, and broad-based empowerment of its citizens, while maintaining environmental integrity. The 11 Strategic Objectives embodied in the WCDSP thus embody the key overarching strategic objectives identified by the incumbent Provincial Government for its term in office (i.e. until 2014). The 11 Objectives are broadly aligned with the 12 National Lekgotla Outcomes (2010), but focuses specifically on the Western Cape development context.

Strategic Outcomes linked to economic, social and environmental sustainability (viz.1-5; 7) are of relevance to the proposed INCA SEF include:

- (1) Increasing opportunities for growth and jobs;
- (7) Mainstreaming sustainability and optimizing resource use and efficiency.

Objective 1 is applicable to both the construction and operational phases of the proposed PVSEF project. Objective 7 is of specific relevance to proposed operational phase activities, specifically savings in non-renewable (fossil fuel) resources and reduced emissions associated with the proposed the generation of energy from renewable sources (Objective 7).

#### **Provincial socio-economic context**

An overview of the current provincial socio-economic and developmental context is provided in an introductory chapter of the WCDSP. The problem statement sections for each of the relevant Outcomes provide additional key information with regard to existing issues specifically in need of priority intervention. As the WCDSP provides a good, fairly up-to-date overview of prevailing provincial socio-economic conditions and developmental challenges, some of the key findings are presented below.

Key demographic findings include the following:

- The province is home to 10% of the national population, but has a GDP share of 14%;
- 32% of the population (~1.67 million people), live in the rural areas of the province;
- The official unemployment rate for the Western Cape was estimated at 23.62% (second quarter 2010). Of the total unemployed, the majority of people were Coloured (272 852) and African (219 777);
- The Western Cape agricultural sector is highly developed and accounts for almost 21% of South Africa's agricultural production and 45% of the country's agricultural exports. An estimated 23% of the West Coast District Municipality (WCDM) population is employed in the agricultural sector.

Key environmental sustainability findings relating to non-renewable resource use and greenhouse gas in the province, include the following:

- Climate change constitutes one of the biggest medium-long term challenges facing local communities. Its effect on the province's natural resources, namely land, water, air, soil and biodiversity, as well as ecosystem goods and services, is

likely to have a major impact on vulnerable economic sectors such as agriculture and communities (especially the poor communities) within the province;

- ~95% of the energy currently used in the province is generated by the burning of non-renewable, greenhouse-effect enhancing fossil fuels (coal and oil). The document notes that this is completely non-sustainable for a number of reasons, including long term resource security (linked, amongst others, to Eskom's capacity and infrastructure), as well as emissions associated with the generation of the electricity;
- In 2004, the Cape West Coast District Municipality (WCDM) generated an estimated 3% of total provincial CO<sub>2</sub> emissions; 14% of the provinces' NO<sub>2</sub> emissions, and 12% of its SO<sub>2</sub> emissions.

### **Action plans and targets for 2014**

The WCDSP includes action plans and targets aimed at addressing priority intervention areas, linked to the Strategic Objectives.

Proposed socio-economic interventions are underpinned by the Administration's beliefs that "economic growth constitutes the foundation of all successful development; that growth is driven primarily by private sector business operating in a market environment; and that the role of the state is (a) to create and maintain an enabling environment for business and (b) to provide demand-led, private sector-driven support for growth sectors, industries and businesses" (WCDSP; 2010: 8).

Key targets which have a potential bearing on the INCA Vredendal proposal include:

- An overall reduction of the current gross provincial product (GPP) to carbon emission ratio by 10% by 2014;
- With regard to combating climate change and greenhouse emissions, six focus areas are outlined in the WCDSP. Of these, the Energy Efficiency Programme is of specific relevance. This programme focuses on increasing the contribution of provincial renewable energy generation, as well as demand management measures. The WCDSP sets a target of 15% electricity generation from renewable sources for the province's needs by 2014.

### **2.3.4 Western Cape Provincial Spatial Development Plan (2009)**

The Western Cape Provincial Spatial Development Framework (PSDF) was approved as a structure plan in terms of Section 4(6) of the Western Cape Land Use Planning Ordinance (LUPO) in June 2009, and consequently has statutory status. The PSDF is a long-term planning instrument, which is to be reviewed every five years. The next revision is due in 2014.

The overarching function of the PSDF is to provide a spatial planning guidance aimed at sustainable development, including social justice and equity, at provincial level. The scale is too coarse - approximately 1:2 500 000 - in order to address the study area specifically.

The purpose of the PSDF is, amongst others, to:

- Provide spatial expression to the Provincial Growth and Development Strategy;
- Guide municipal (district, local and metropolitan) Integrated Development Plans and Spatial Development Frameworks and provincial and municipal Spatial Development Plans;

- Provide clear signals to the private sector about desired development directions;
- Increase predictability in the development environment, for example by establishing “no go”, “maybe” and “go” areas for development; and,
- Redress the spatial legacy of apartheid.

According to the PSDF, development can only be acceptable and in the public interest if it is environmentally sustainable – that is ecologically justifiable, socially equitable as well as economically viable - and then in a hierarchical relationship where economic efficiency (prosperity) is underpinned by social equity (human capital), which in turn is underpinned by ecological integrity (ecological capital – or health of ecological systems). The PSDF emphasises that in the South African context, the aspect of social equity is of extreme relevance, as it emphasises the need to redress the wrongs of the past (social justice) as a central component of social sustainability.

The PSDF, and specifically the objectives and directives contained in it, are aimed precisely at providing such guidance, as applicable to the spatial development situation prevailing in the Western Cape at present.

Land use orientated objectives and developments are set out in Volume 2 (“Directives and Guidelines Report”) of the PSDF. Nine key objectives and associated policy directives are contained in the Report. The following are of specific relevance to the proposed Vredendal PVSEF development:

#### **Objective 5: Conserve the sense of place of important landscapes**

The PSDF notes the vital importance of tourism to the Provincial economy. The PSDF therefore stipulates that, with regard to the siting and design of future power lines and other visibly substantial infrastructural development, the relevant provincial guidelines should be followed, and proposals should include provision for environmental, visual and heritage impact assessments.

Two policy directives are of direct relevance to the proposed PVSEF:

#### ***Transmission lines and siting***

*HR26 (...) transmission lines (...) should be aligned along existing and proposed transport corridors rather than along point to point cross-country routes.*  
(Mandatory directive)

The PSDF notes that the current practice of following a shortest-distance approach to the siting of power lines raises issues of visual blight, unviable-shaped land parcels, the need for access roads and the degradation of cultural landscapes. The PSDF therefore stipulates that, where possible, future power lines should be aligned within existing and proposed combined road and/or rail linkage corridors.

The potential visual impacts associated with PVSEFs are likely to be lower than those associated with wind energy facilities. The potential impact on the areas visual character and sense of place will be informed by the findings of a specialist Visual Impact Assessment (VIA). In addition, as indicated above, the area has been impacted upon by existing power and railway lines.

## **Objective 9: Minimize Consumption of Scarce Environmental Resources**

The PSDF notes that greenhouse gas emissions are partially responsible for global warming, which is resulting in major negativities and even disasters in the short and medium term. In line with national government's Climate Change Response Strategy, the PSDF makes provisions for a strategy based on demand management and the development of renewable resources, such as solar and wind. With regard to renewable sources, the PSDF proposes that 25% of the Province's energy generation should consist of renewables by 2020.

### **2.3.5 Western Cape Amended Zoning Scheme Regulations for Commercial Renewable Energy Facilities (2011)**

Amendments to the Western Cape Land Use Ordinance (1985) (LUPO) have recently been promulgated in order to guide the development of commercial renewable energy generation facilities (REFs), mainly wind and solar<sup>2</sup>. These Zoning Scheme amendments are specifically intended to provide guidance with regard to land use compatibility, and applicable development restrictions and conditions, including provision for mandatory rehabilitation post construction and final decommissioning ("abandonment" in terms of the Provincial Notice<sup>3</sup>). The ambit of the Regulations include all REFs as well as associated ("appurtenant") infra/ structure(s) operated for commercial gain, irrespective of whether such feed into the electricity grid or not. The section below provides an overview of key points of relevance to the INCA Vredendal PVSEF proposal.

#### **Zoning status**

- In terms of zoning status, "renewable energy structures" are designated as a consent use in the zone Agriculture I.

#### **Land use restrictions**

- Restrictions with regard to height are mainly applicable to wind energy facilities (WEFs), but associated on-site buildings for all REFs are limited to a maximum of 8.5 m (ground to highest point of roof);
- Restrictions with regard to setback are essentially only applicable to WEFs, and not SEFs.

#### **Establishment of a Rehabilitation Fund**

- Prior to authorization, the applicant ("owner") must make financial provision for the rehabilitation or management of negative environmental impacts, as well as of negative impacts associated with decommissioning or abandonment of the facility. Such provision should be in the form of a fund to be administrated by the Municipality, and should be to the satisfaction of the competent authority (i.e. Department of Energy).

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<sup>2</sup> Province of the Western Cape (2011). *Provincial Gazette 6894, Friday 29 July 2011*; PN 189/2011 (pp. 1381-6).

<sup>3</sup> "A Renewable energy structure shall be considered *abandoned* when the structure fails to continuously operate for more than one year" (§ 4(3) (m)).

### **Land clearing/ erosion management**

- Land clearing should be limited to areas considered essential for the construction, operation and decommissioning of an REF;
- All land cleared during construction which does not form part of the REF structural footprint, must be rehabilitated in accordance with an approved rehabilitation plan;
- Soil erosion must be avoided at all costs, and any high risk areas should be rehabilitated.

### **Visual impact management**

- Visual and environmental impacts must be taken into account, to the satisfaction of the competent authority;
- Solar infrastructure should be designed and erected in order not to give rise to any adverse effects caused by the reflective nature of the PV arrays;
- Associated structures (i.e. sub-stations, storage facilities, control buildings, etc.) must be screened from view by indigenous vegetation, and/or located underground, or be joined and clustered to avoid adverse visual impacts. In addition, appurtenant structures must be architecturally compatible with the receiving environment;
- Lighting should be restricted to safety and operational purposes, must be appropriately screened from adjacent land units, and should also be in accordance with applicable Civil Aviation Authority requirements.

### **Operational management and maintenance**

- REFs may not cause or give rise to any noise or pollution, deemed to be a nuisance in terms of applicable Environmental Impact Assessment (EIA) regulations or Municipal by-laws;
- The REF owner/ operator is responsible for maintaining the REF in a good condition, including with regard to painting, structural repairs, ongoing rehabilitation measures (e.g. erosion), as well as the upkeep of safety and security measures.

### **Decommissioning management**

- An REF which has reached the end of its lifespan or that has been abandoned must be removed. The owner (operator) is responsible for the removal of such structures in whole, no longer than 150 days after the date of discontinued operation, and the land must be rehabilitated to the condition it was in prior to construction of the facility;
- Decommissioning activities must include the removal of all REF structures, associated structures, as well as transmission lines; the disposal of solid and hazardous waste according to applicable waste disposal regulations; and the stabilization and re-vegetation of the site. In order to minimize disruptive impacts on vegetation, soils, etc., the competent authority may grant approval not to remove any underground foundations or landscaping.

In conclusion, it should be noted that the relevant provisions are mandatory (compliance requirements), and would therefore have to be implemented by INCA.

## **2.4 LOCAL LEVEL POLICY AND PLANNING**

### **2.4.1 Matzikama Local Municipality IDP (2006-2011)**

The Matzikama Integrated Development Plan (IDP) five-year plan (2006-2011) identifies 22 main IDP priorities (grouped in 7 clusters). Of these clusters and priorities, the following can be linked to the proposed PVSEF:

- Reduce poverty;
- Job creation;
- Effective use of natural resources;
- Promote and support investment in infrastructure - new and upgrades;
- Promote tourism and investment opportunities;
- Promote human resource development.

Identified key challenges include:

- In-migration of indigent and unemployed people from other parts of the Western Cape as well as other provinces (mainly the Northern Cape) – mainly linked to agriculture (Olifants River Valley) and mining activities;
- Limited development opportunities in established economic sectors (agriculture, mining);
- Great existing seasonal unemployment, mainly coupled to seasonal opportunities in the agricultural sector.

A review of the IDP 2009/2010 and 2010/2011 revisions indicates a number of key performance areas that are potentially relevant to the proposed PVSEF, namely:

- The provision of basic services to the best possible level;
- Human development to enable people to develop to their full potential;
- Economic development with full participation to all and with focus on both First and Second economies.

The review also identified a number of key issues that are pertinent to the proposed PVSEF. These include:

- The lack of skills and training facilities in our communities are contributing largely to our poor developed economies particularly in terms of Black Economic Empowerment;
- The lack of project development aid for the local communities has had a negative impact on Black Economic Empowerment (BEE) and has made it increasingly difficult for BEE to contribute meaningfully on the local economy;
- The role of the West Coast District Municipality is very limited in supporting the local municipalities in regards to local economic development;
- Successful economic development is a function of well-established industrial bodies such as Emerging Farmers, Women in Construction, Fishing and Aquaculture, Commercial Farmers etc. A concern is that many of these organisations do not function effectively due to lack of leadership, expertise, funding etc.

The Local Economic Development Strategy also stresses the importance of private sector involvement in the creation of job opportunities.

#### **2.4.2 Matzikama Tourism Growth Strategy (2010-2015)**

The Matzikama Tourism Growth Strategy 2010-2015 (MTGS) was compiled by the Matzikama Tourism Association in July 2010 (Matzikama Toerismevereniging; 2010). The document has been endorsed by the Matzikama Municipality as key enabling strategy for local employment creation and social empowerment. Key potential benefits with growth of the sector are associated with direct and indirect employment creation, downstream spending in the local economy, a general trickle-down effect of benefits to the broader Matzikama community, as well as specific direct and indirect opportunities for small and medium enterprises (SMEs).

Key aspects of the MTGS of relevance to the proposed INCA Vredendal SEF are the following:

##### **Status quo analysis**

- No detailed quantitative data is currently available with regard to the size, value and character of the Matzikama tourism sector. Estimates however indicate that the sector currently accounts for ~1300 direct and indirect employment opportunities;
- Matzikama currently accounts for a very small percentage of tourism flows into the Western Cape, viz. ~0.8% of domestic and ~0.4% of foreign visitors. Matzikama tourism only accounted for 0.8% of tourism beds available in the Western Cape, and 0.5% of total visitor spending in the province in 2008;
- The Matzikama tourism sector is still in its infancy. Key shortcomings currently include inadequate branding and marketing, limited existing tourism services and institutional arrangements, varying levels of standard and value for money provided by individual operators, as well as the fact that large parts of the MM are inaccessible or restricted (due to mining activities). Many local operators currently feel that the sector is underperforming;
- Seasonal wildflower displays and the area's diverse and unique botanical heritage currently constitute the MM's key established tourism asset and draw card, and greatest comparative advantage over other regions in the Western Cape. Other assets include a number of established wine cellars (mainly in the Olifants River Valley), the "Namaqua-West Coast cultural experience", relatively affordable accommodation, and relatively good supportive infrastructure (roads, etc) in the area. Wilderness/ outdoors/ eco based tourism (4x4; hiking; bird watching, etc) constitutes a further key potential asset, but opportunities are currently still isolated, and development of the subsector lacking in co-ordination. In addition, a formal, integrated wine route still needs to be established;
- Key opportunities are associated with the Matzikama's location in reasonable proximity to the City of Cape Town and other large urban areas in the Boland (3-4 hour drive), making the area suited for weekend getaways. In addition the N7 Cape-Namibia route traverses the MM, and opportunities exist for diverting traffic into the MM area. (Note however that N7 via the (proposed) Vanrhynsdorp "N7 gateway" is located 30 km east of the INCA site).

##### **Proposed Growth Strategy**

- The overall aim of the MTGS is to establish a strong and growing local tourism sector by 2020, such to be based on the key principles of sustainable resource management;
- Associated key objectives include the stimulation of local direct and indirect employment opportunities and tourism spending in the general local economy, as

well as increased participation of local entrepreneurs, especially members of historically disadvantaged communities;

- Key branding and marketing would focus on promoting the area's unique eco assets, and the public perception of the Matzikama as a hospitable, relaxed, unpretentious rural "get away" destination;
- Targeted marketing is proposed in three key areas, viz. investment in the Western Cape domestic market, mainly associated with short breakaway/ self-drive and eco-tourism activities (60%); maintaining the established, traditional market segment – wildflower tour groups, etc. (20%), and the tactical development of various outdoors/ wilderness/ eco activities – bird watching, hiking, 4x4 routes, etc. (20%);
- The Western Cape and the City of Cape Town specifically, are identified as the key strategic target market for establishing and growing the Matzikama brand. It is envisaged that successful marketing would eventually attract tourism flows associated with the CCT and Province to the MM area. As mentioned, promotion of a relaxed rural break-away experience would form the keystone of the relevant branding/ marketing strategy.

#### **2.4.3 Matzikama Spatial Development Framework (2010)**

The 2007 Matzikama Spatial Development Framework (SDF) was revised and updated in September 2010. The updated SDF is explicitly aligned with the PSDP and other applicable higher order policy<sup>4</sup>.

Much of the status quo analysis underpinning the SDF is based on relatively dated demographic and other information (e.g. Census 1996; Census 2001). The SDF does however identify a number of key aspects and trends which continue to be of relevance. Key points of relevance to the proposed INCA Vredendal PVSEF include the following:

- Agriculture (and associated processing) and mining constitute the key economic sectors in the MM. This is linked to intensive agriculture in the Olifants River Valley (viticulture, fruit and vegetables), and diamond and mineral sand mining operations (mainly along the coast);
- Economically-motivated in-migration patterns are established, mainly linked to people from the MM, WCDM, the Northern Cape Province and elsewhere, in search of employment opportunities, and especially seasonal opportunities in the agricultural sector (mainly intensive operations in the Olifants River Valley);
- Unlike the southern parts of the WCDM (e.g. Langebaan, Riebeeck Kasteel, Paternoster), the MM has not become established yet as a key lifestyle relocation/ retirement destination;
- Urban population growth in the Olifants River Valley towns, and especially Vredendal and Lutzville, has been significant over the past decade or so. This is linked to economically-motivated in-migration (and subsequent labour stranding), as well as the absorption of displaced agricultural labour within the MM itself<sup>5</sup>;

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<sup>4</sup> Including the Development Facilitation Act (Act 67 of 1995), the National Biodiversity Strategy and Action Plan (2005) and the National Spatial Development Perspective (2006).

<sup>5</sup> This situation prevails in most of the province, and is largely linked to the promulgation of the Extension of Security of Tenure Act (1998), which ironically saw many tenured farm labour households not qualifying for permanent tenure in terms of the Act, losing tenure on farms. This trend is reinforced by a general decline in employment provision of the provincial agricultural sector over the past decade or more, mainly linked to increasing mechanization.

- Vredendal's population is anticipated to continue growing significantly in the medium term. This is linked to the town functioning as leader town in the MM, and as regional service centre for the key agricultural and mining sectors in the MM;
- Lutzville is not anticipated to grow significantly in the medium term, but may absorb some of Vredendal's market housing demand (as properties tend to be more affordable). Available employment opportunities would likely result in people commuting to work in Vredendal;

The focus of the SDF is essentially on urban areas, and specifically with regard to the demarcation of urban edges, and the development of densification and socio-spatial integration strategies. Spatial Development Plans (SDPs) are also provided for the MM's 11 identified urban areas. In this regard, it should be noted that the proposed INCA Vredendal PVSEF site is located ~10 km (linear) from the nearest urban areas, (viz. Lutzville and Vredendal to the west and east, respectively), and is not covered in the SDPs for neither Lutzville nor Vredendal.

Section 6.3.3 of the SDF provides a number of rural land management principles for the MM. The following are of specific relevance:

- The conservation of primary and unique agricultural land, especially land suitable for intensive operations (and potential associated downstream local beneficiation activities in manufacturing, etc.) is supported;
- Agro-tourism and Eco/ adventure-based tourism development should be supported. Operations need to conform to applicable environmental and land use management principles. Visual impact management is identified as a key requirement;
- In general, development should seek to avoid visually sensitive areas in order not to compromise the MM's scenic amenity. In this regard, the siting of development on ridgelines, hills and mountains should be avoided;
- Land use practices/ development should avoid any significant damage to the MM's unique and diverse vegetation (biodiversity, habitat and tourism assets) (MM; 2010).

## **2.5 INTERNATIONAL EXPERIENCE WITH SOLAR ENERGY FACILITIES**

The proposed facility is a PV facility as opposed to a Concentrating Solar Power (CSP) plant. In this regard the majority of the international experience is based on PVs as opposed to CSP facilities. In this regard the key differences in terms of potential impacts relate to the use of water and the visual impacts associated with the large tower structures associated with CSP plants. CSP plants (like most conventional power plants) require large volumes of cooling water, which make them less suited to arid, water scarce environments, such as the Karroo. PV facilities on the other hand, such as the proposed PV facility, do not require cooling water, and as such are more suited to areas where water is a scarce resource.

In terms of visual impacts, parabolic troughs and power towers, where the solar energy from the solar reflectors is concentrated, as are associated with CSP facilities, are likely to have a higher visual impact than the solar panels associated with PV facilities.

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## **SECTION 3: OVERVIEW OF THE STUDY AREA**

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### **3.1 INTRODUCTION**

Section 2 provides an overview of:

- The administrative context;
- The provincial context;
- The policy and planning environment affecting the proposed PV facility;
- The local socio-economic environment;
- Surrounding land uses.

### **3.2 ADMINISTRATIVE CONTEXT**

#### **3.2.1 Introduction**

The proposed INCA Vredendal PVSEF facility is located in the Matzikama Municipality (MM), which is one of five local municipalities that make up the West Coast District Municipality (WCDM) (DC01). The other four local municipalities that make up the WCDM are the Cedarberg, Bergriver, Saldanha Bay and Swartland municipality, all located to the south of the MM. The WCDM is bordered by the Northern Cape Province to the north, and the Cape Metro and Cape Winelands District Municipality to the south and south-east. The western border is formed by the Atlantic Ocean, which forms the basis of the WCDM's large and established fishing sector.

The MM is comprised of 8 Wards, with the administrative seat based in Vredendal (Photograph 3.1). The INCA site is located in the Ward 8 area (rural). The relevant portion of Ward 8 is sandwiched between Wards 1 and 3. Key potentially affected communities are mainly associated with Wards 1 (Lutzville, Uitkyk, Koekenaap), and 3 (Vredendal North). Lutzville West, Uitkyk and Vredendal North specifically constitute the key relevant historically disadvantaged communities within these Wards. The relevant communities are all located ~10 km from the INCA site. Koekenaap, another HD community in Ward 1, is located ~17 km west of the site.

#### **3.2.2 Settlement patterns**

The MM is essentially a rural municipality. Much of the extensive municipal area<sup>6</sup> is comprised of arid to semi-arid land, mainly used for sheep farming purposes, but also accommodating a number of large mining operations (Transhex, Namaqua Sands, etc). Outside of the fertile Olifants River Valley (and associated irrigation scheme areas), and with the exception of Vanrhynsdorp and the two small coastal settlements of Strandfontein and Doringbaai, the MM settlement pattern is extremely sparse. Commercial stock farming units are typically large (>6000 ha), and support very limited tenure opportunities – typically a farmstead and a small number of labourer's houses (associated with limited employment associated with stock farming). Many farmers own or rent additional farms for use as stock posts. Minimal

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<sup>6</sup> The former WCDM District Municipal Areas (DMAs) have recently been incorporated into the MM, effectively increasing the MM area all the way up to the Northern Cape Province border.

tenure (typically just a watchman/ herder) are associated with stock posts. A significant portion of MM land is furthermore comprised of scattered tracts of state land, mostly vacant or leased to commercial farmers for grazing purposes (van der Westhuizen – pers. comm).



**Photograph 3.1: Town of Vredendal viewed from the R362**

Large portions of the MM are considered of key botanical/ conservation significance (very high endemic succulent bio-diversity). The central Knersvlakte portion of the MM forms part of multi-stakeholder Succulent Karoo Ecosystem Programme (SKEP) co-ordinated by the South African National Botanical Institute (SANBI).

Vredendal is by far the largest town in the area (2011 projected total of ~20 000 inhabitants). The town is centrally located, and thus ideally suited as the MM's economic and administrative centre. Other settlements in the MM include Klaver, Vanrhynsdorp, Lutzville, Koekenaap, Ebenhaeser, Papendorp, Strandfontein and Doringbaai. Vanrhynsdorp, Klaver and Lutzville can be regarded as secondary towns with established business districts. Ebenhaeser is a small mission town adjacent to the Olifants River Estuary, and Papendorp a very small settlement located at the mouth of the Olifants River. Doringbaai and Strandfontein are the key seaside towns in the MM.

### **3.2.3 Road access**

The primary access road to the MM is the N7 (Cape Town – Namibian border) (Figure 1.1 and 3.1). The Olifants River Valley portion of the MM is located to the west of the N7, and can be accessed either via the R363 (Klaver) or the R27 (west of

Vanrhynsdorp). The R362 is of specific relevance to the INCA proposal. The R362 runs from Klawer in the south, and joins up with the R27 ~5 km east of Vredendal. From the point of intersection the R27 continues west as the R362, via Vredendal (north of the Olifants River) and Lutzville. In Lutzville the alignment switches south, providing the main road link to the coastal settlements of Strandfontein and Doringbaai.

The INCA site is located <1 km to the north of the stretch of R362 between Vredendal and Lutzville (approximately halfway in between). This portion of the R362 is locally known as the "Holrivier Road" (Photograph 3.2). The eastern portion of the Holrivier Road (essentially east of the Hol River, including the stretch of road to the south of the INCA site) is tarred; the western portion to Lutzville is a gravel road (but potentially upgraded to tar in the medium term (van der Westhuizen – pers. comm)).

The Holrivier Road provides primary access to farms located along the northern banks of the Olifants River (Liebendal agricultural area), some of whose land also extends north of the R362 (e.g. the subject site on the parent farm Gordononia, and the adjacent Liebendal farm located to the west of Gordononia). Access to the Juno substation (located on Gordononia) and the Sishen-Saldanha railway line servitude road is also off the road. The Holrivier, Liebendal and Strandfontein railway sidings (Vredendal-Koekenaap goods line) are also accessed off the road. The sidings are no longer used, but the associated rail servitude roads are.



**Photograph 3.2: R362 "Holrivier Road" - view from north-east – INCA site located on left far distance; Eskom Juno on the right**

In addition, the Holrivier Road provides a key function to Matzikama residents. It is used as a quieter alternative to the R363 (which carries the bulk of tourism traffic to the MM), and constitutes the only road link from Lutzville to Klawer which is not prone to intermittent flooding events associated with the Olifants River and tributaries (e.g. Hol River). Tourism traffic along the Holrivier Road is currently limited (“almost by chance” – van der Westhuizen), and the road is not currently considered of key scenic or tourism importance (van der Westhuizen; van Zyl – pers. comm).

### 3.3 SOCIO-ECONOMIC CONTEXT

The demographic overview is based on data from the most recent (but dated) national Census (2001). Data from the Socio-Economic Profile: West Coast District (2006) is also presented. Where available, more recent estimates provided by interviewees have also been included.

#### Population

With the exception of the Olifants River Valley, the MM area is sparsely populated with an estimated population of 50 207 (2001). Approximately 40% of the population lived on farms or smallholdings, with the agricultural areas in and around Vredendal accounting for approximately 30% of the remaining population. Vredendal was the most significant urban settlement in the area, accounting for more than 32% of the total population. After Vredendal, Lutzville was the second most populous town, with an estimated 8.5% of the total population. The communities of Doringbaai (2%), Koekenaap (2%), and Ebenhaeser (1%) were all relatively small. The overwhelming majority of the population was Coloured (76%), followed by White (18%) and Black Africans (6%) (Table 3.1).

Between 2001 and 2006 the Matzikama population increased from 50 088 to 58 840, at an annual average growth rate of 3.3%. This represents the highest growth rate in the West Coast District Municipality. Population growth was expected to slow down to an average annual rate of 2.5 % between 2006 and 2010 (Source, Socio-Economic Profile: West Coast District, 2006). In-migration into the Matzikama area is projected to remain steady around the 1 000 mark up to 2015. The majority of the people moving to the area are from the Coloured population group. Coloured in-migration in 2006 is projected to be in the region of 688. African in-migration (second largest) declined between 2001 (444 in-migrants) and 2005 (140 in-migrants), but is expected to increase again gradually between 2006 and 2025 (454). In-migration by Whites to the area is low (Socio-Economic Profile: West Coast District, 2006).

**Table 3.1: Population data for Matzikama**

Population Group	Matzikama LM	
	Number	%
Black African	2825	6
Coloured	38118	76
Indian or Asian	75	0
White	9192	18
Total	50210	100

**Source: Census 2001**

Afrikaans was the dominant first language in the area, with an estimated 95% being native speakers. IsiXhosa was the second most dominant (3.5%), and English third (1%) (Table 3.2).

**Table 3.2: First Language spoken data for Matzikama**

	<b>Matzikama %</b>
<b>Afrikaans</b>	95
<b>English</b>	1
<b>isiNdebele</b>	<0.5
<b>isiXhosa</b>	3.5
<b>IsiZulu</b>	<0.5
<b>Sepedi</b>	<0.5
<b>Sesotho</b>	<0.5
<b>Setswana</b>	<0.5
<b>SiSwati</b>	<0.5
<b>Tshivenda</b>	<0.5
<b>Xitsonga</b>	<0.5
<b>Other</b>	<0.5

**Source: Census 2001**

#### **Age distribution**

Census data from 2001 indicate that approximately 65 % of the MM population fell within the economically active age group of 15-65; 30% were 14 or younger, and 5% were 65 years or older (Table 3.3).

**Table 3.3: Age distribution for Matzikama**

<b>Age Group</b>	<b>Matzikama %</b>
0-4	9.5
5-9	10
10-14	10
[Youthful dependents]	[29.5]
15-19	9
20-24	7.5
25-29	8
30-34	8.5
35-39	8
40-44	7
45-49	6
50-54	4
55-59	3.5
60-64	3
65-69	2
70-74	1.5
75-79	1

80 and over	1
	0.5

**Source: Census 2001**

### Education levels

As illustrated in Table 3.4 below, education levels in the Matzikama LM are low. Based on the 2001 data for persons over the age of 5 years, approximately 12% of the Matzikama populations had never received any schooling. Functional illiteracy/innumeracy levels for the area are also high, namely 44% and only 12% of the Matzikama population had completed secondary schooling, with 4% going on to achieve a tertiary qualification. Given the strong correlation between education and skills levels, it may be assumed that a significant portion of the study area's working age population have only sufficient skills for elementary jobs.

**Table 3.4: Matzikama Education levels**

Description	Matzikama %
No schooling	12
Some primary	32
[% functional illiteracy/ innumeracy] <sup>7</sup>	44% [20187]
Complete primary	10
Some secondary	30
Std 10/Grade 12	12
Higher	4

**Source: Census 2001**

### Employment levels

Based on 2001 Census data, approximately 10.5% of the population in the MM was unemployed (Table 3.5). Actual seasonal unemployment rates may be significantly higher, due to the seasonal nature of the demand for labour associated with the fruit and vegetable cropping operations along the Olifants River Valley. In this regard, the MM IDP Manager has indicated that an estimated 30% of the MM Olifants River Valley population is currently estimated unemployed (Phillips – pers. comm).

The Ward 1 Councilor has indicated a figure of 37% for the unemployed youth in the Ward 1 communities (Koekenaap, Uitkyk, Lutzville West) (Bam – pers. comm). A study undertaken for the WCDM in 2001 estimated that at least 50% of people employed in elementary work were effectively unemployed or underemployed. In the MM, females, Africans, young people and those with lower levels of formal education — especially those with incomplete secondary education — are highly affected by unemployment. Youth unemployment is particularly high, with 70 % of the

<sup>7</sup> In the South African context, having obtained a primary qualification (i.e. having successfully passed Grade 7) is generally held as the absolute minimum requirement for functional literacy/ numeracy. The National Department of Education's ABET (Adult Basic Education and Training) programme provides education and training up to the equivalent of Grade 9. In this more onerous definition, Grade 9 is required as the minimum qualification for having obtained a basic education ([www.abet.co.za](http://www.abet.co.za)).

unemployed being between the ages of 15 and 34 (Socio-Economic Profile: West Coast District, 2006).

**Table 3.5: Matzikama employment levels (15 – 64 age groups)**

Description	Matzikama %
Employed <sup>8</sup>	57
Unemployed	10.5
Not Economically Active <sup>9</sup>	32.5

**Source: Census 2001**

### Household income

Based on the 2001 Census data, poverty rates in the MM areas are high, with an estimated 55.5% of the households in the MM earning an income of R1 600 or less per month in 2001 (Table 3.6). Given the seasonal nature of the agriculture and fishing industry, many households in the MM area do not have access to income throughout the year.

**Table 3.6: Household income (by head of household)**

Income per month	Matzikama %
No formal income	6
R 1 – R 400	4
R 401 – R 800	20
R 801 – R 1 600	25.5
[% households below minimum subsistence level]	[55.5]
R1 601 – R 3 200	20
R 3 201 – R 6 400	12
R 6 401 – R 12 800	7
R 12 801 – R 25 600	3
R 25 601 and higher	2.5

**Source: Census 2001**

According to the 2010-2014 WCDM IDP, an estimated 45% of the inhabitants of the Matzikama LM are dependent on social grants. This represents a significant percentage of the population and also highlights the limited employment opportunities (WCDM; 2010).

### Sectoral employment

Table 3.7 below provides an overview of proportional employment per economic sector by head of household for MM, as per Census 2001. As indicated, the

<sup>8</sup> Census 2001 official definition of *an unemployed person*: "A person between the ages of 15 and 65 with responses as follows: 'No, did not have work'; 'Could not find work'; 'Have taken active steps to find employment'; 'Could start within one week, if offered work'." ([www.statssa.gov.za](http://www.statssa.gov.za)).

<sup>9</sup> The term "not economically active" refers to people of working age not actively participating in the economy, such as early retirees, students, the disabled and home-makers.

Agricultural sector was the dominant employment provider, accounting for 46% of employment opportunities in the MM. Community, Social and Personal services and Wholesale and Retail Trade sectors represented the joint second most significant sectoral providers for the LM (12% each). As discussed in Section 3.4. below, opportunities in the fishing and primary agricultural sectors have declined over the past decade, and appear to be on a long term decline. The mining sector on the other hand – accounting for only ~5% of opportunities in 2001 - appears to have remained a stable provider. Current indications are that at least 2 x large rare earth mining/ processing facilities are due to be constructed in the MM soon (Phillips –pers. comm).

**Table 3.7: Sectoral contribution to employment in MM**

Description	Matzikama %
Agriculture, hunting, forestry and fishing	46
Mining and quarrying	5
Manufacturing	6
Electricity, gas and water supply	0.5
Construction	4
Wholesale and retail trade	12
Transport. Storage and communication	3
Fin., real estate and bus. Services	4.5
Community, social and personal services	12
Private households <sup>10</sup>	7

**Source: Derived from Census 2001**

### 3.4 KEY ECONOMIC ACTIVITIES

Information contained in the 2006 Socio-Economic Profile: West Coast District indicated that 18.3% of economic activity generated by the Matzikama was linked to Agriculture, Forestry and Fishing. Wholesale and Retail Trade, Catering and Accommodation (17.7%), and Manufacturing (13.1%), followed by Finance and Business Services (11.7%) and General Government Services (11.2%) were further key sectors. Together, these sectors make up 72 % of MM’s economic output in 2004 (PGWC; 2006).

As apparent from the above, the MM sub-regional economy is traditionally based on primary sector activities such as agriculture, fishing and mining - both in terms of employment provision, as well as economic throughput. In addition, major links to local processing exist. Associated opportunities with mining and agriculture (food and beverages) appear to have remained intact, or may be expanding. Those in fisheries have largely disappeared (see further below).

Tourism currently constitutes a small but growing sub-sector, and appears to hold good potential for further expansion. As discussed in Section 2.3.3, the Matzikama Tourism Association (MTA)/ MM in 2010 launched a Tourism Growth Strategy (MTGS), currently being keenly and energetically pursued. A brief overview of the MM tourism sector is provided in conclusion.

<sup>10</sup> This category mainly comprises domestic workers and gardeners.

### **3.4.1 Agriculture, forestry and fishing**

The agriculture, forestry and fishing sector is the largest economic sector in the MM. Its total contribution to Matzikama's GDP in 2004 was R150.5 million or 18.3%. The West Coast fisheries sub-sector, including the MM (Ebenhaeser, Doringbaai), has been in gradual decline over the past decade or more. This is directly linked to declining fish stocks and the collapse of the Doringbaai crayfish resource. In consequence, the 18.3% contribution of the sector is largely associated with the agricultural sub-sector.

Agriculture constitutes the dominant form of land use and economic sector in the MM. The MM area on the whole is an arid, sparsely populated area. Outside of the Olifants River Valley, agricultural activities are mainly associated with extensive sheep farming operations. Small stock carrying capacities are low (linked to aridity of the region - <1 small stock unit per 10 hectares). Large tracts of land are therefore required to render individual operations viable. In this regard, interviewees have variously indicated that units of at least 6000 ha – 10 000 ha are required for a viable commercial operation (De Waal; Phillips – pers. comm).

As indicated above, most of the MM population and economic activity is concentrated within the lower Olifants River valley. Lutzville, Vredendal and Klawer are all situated on the banks of the river. The river, with its associated canal systems, supports a flourishing agricultural sector that is largely linked to viticulture (cultivation and processing of mainly wine grapes) and, increasingly, the production and processing of fruit (citrus) and vegetables (tomatoes, cucumbers and vegetable seed stock). Water is the major limiting factor to the increased lateral expansion of irrigation activities along the Olifants River (De Waal; Zandberg – pers. comm).

A large number of the casual employment opportunities associated with cropping operations in the region's irrigation agriculture sub-sector are seasonal in nature. Current trends in local agriculture appear to include a gradual mechanization of key operations (e.g. pickers being replaced by mechanical grape harvesters), and a general preference for labour from other SADEC countries (Phillips – pers. comm).

Ward 1 and 3 Councilors have indicated that primary agricultural opportunities continue to remain the key source of opportunities for members in their communities, including women (Bam; Mqingqi – pers. comm). The relevant Ward 1 Councilor has further indicated that, while unemployment amongst the local youth is high (estimated 37%), the affected group is disinclined to pursue opportunities as agricultural labour. This is linked to the perception of limited income and advancement opportunities associated with the sector (Bam – pers. comm).

The region's reliance on the fisheries and agricultural sector has been identified as a key concern by the local authorities in the area. As a result in 2001 the Vredendal Chamber of Commerce identified economic diversification as a key economic imperative for the sub-region. As indicated above the need for diversification away from these sectors is probably more urgent than ever. This is linked to established long term trends in both sub-sectors.

### **3.4.2 Mining**

The mining sector accounted for ~5% of employment opportunities in the MM in 2001. It appears to have remained a stable provider of opportunities, across the entire skills spectrum. This is linked to expanded operations associated with

Namaqua Sands (Brand se Baai, Koekenaap), as well as emerging further inland mining/ processing operations to be located north of Vredendal.

A number of mining operations are traditionally located in the MM. Of these, the current diamond mining operations of Trans-Hex at Die Punt (Matzikama) and the Namakwa Sands (Exxaro) Heavy Minerals sand mining operations at Brand se Baai (WCMA01) are the most significant. Trans Hex operations at Die Punt employed 38 permanent staff members and 44 contractors in 2001, and associated contractors a further ~300-350 workers. The estimated annual turnover in 2000 for the Trans Hex operations at De Punt was in the region of R50 million.

The Namakwa Sands operations at Brand se Baai and associated processing activities near Koekenaap currently employ approximately 900 people. The minimum qualification for the Namakwa Sands personnel is Grade 10 and approximately 80% of the employees are from the WCDM area. Namakwa Sands also creates indirect employment opportunities for a large number of sub-contractors including cleaning, security and rehabilitation companies. In this regard the service and engineering sectors in Vredendal and Lutzville have benefited significantly from the mining industry in the area. Current indications are that at least 2 x large rare earth mining/ processing facilities are due to be constructed in the MM soon (Phillips –pers. comm).

### **3.4.3 Manufacturing**

The Manufacturing sector contributed R 107.9 million (13.1%) to the MM GDP in 2004 making it the third largest sector in the MM. The sector is strongly linked to the agriculture sector, with focus on the manufacture of food and beverages. Examples include Tiger Brands' processing plant (mainly tomatoes) near Koekenaap, and Namaqua Wines' industrial-scale cellars south of Vredendal. This sub-sector accounted for 67.1 % of the total manufacturing in the sector for 2004. The next largest contributing sub-sectors were Metals with 7.8 % and Transport Equipment with 7.6 %. These two sub-sectors are closely linked to the mining and agricultural sectors (Socio-Economic Profile: West Coast District, 2006).

No renewable energy facility (REF) components manufacturing operations or initiatives currently appear to be located in the MM (Philips – pers. comm). However, given the fact that the study area towns have been servicing the mining industry's engineering needs for a number of decades, the potential for medium/ long term manufacturing/ servicing/ maintenance development with regard to REFs does not seem an unlikely assumption. This may however require specific and co-ordinated targeting by the MM and other key stakeholders, as well as an initial proved establishment of a number of REFs in the MM order to justify such strategic targeting. In addition, local manufacturing may have likely have to complete with more favorably located, and likely larger, operations currently envisaged for the Saldanha (Saldanha Bay Municipality) area (Barbour and van der Merwe; 2011b).

### **3.4.4 Tourism**

The key baseline findings contained in the 2010 Matzikama Tourism Growth Strategy are summarized below:

- The sector currently accounts for ~1300 direct and indirect employment opportunities;

- Matzikama accounted for ~0.8% of domestic and ~0.4% of foreign visitors to the Western Cape, 0.8% of tourism beds available in the Western Cape, and 0.5% of total visitor spending in 2008;
- The Matzikama tourism sector is still in its infancy. Key shortcomings currently include inadequate branding and marketing, limited existing tourism services and institutional arrangements, varying levels of standard and value for money provided by individual operators. Many local operators currently feel that the sector is underperforming;
- Seasonal wildflower displays and the area's diverse and unique botanical heritage currently constitute the MM's key established tourism asset and draw card, and greatest comparative advantage over other regions in the Western Cape.
- Other assets include a number of established wine cellars (mainly in the Olifants River Valley), the "Namaqua-West Coast cultural experience", relatively affordable accommodation, and relatively good supportive infrastructure (roads, etc) in the area;
- Wilderness/ outdoors/ eco based tourism (4x4; hiking; bird watching, etc) constitutes a further key potential asset, but opportunities are currently still isolated, and development of the subsector lacking in co-ordination. In addition, a formal, integrated wine route still needs to be established (MTA; 2010).

Key opportunities are associated with the MM's location relative to the City of Cape Town and other large urban areas in the Boland (3-4 hour drive) which make the area well suited for weekend getaways. In alignment with the MTGS, the MTA has targeted the regional and domestic Western Cape markets, specifically by offering cultural (festivals, etc.) as well as weekend-break aways and nature-based opportunities. Seasonal wildflower displays and botanical interest remain established key anchoring assets, and are recognised and managed as such. Niche growth (4x4 routes, trails, etc.) opportunities are also being pursued. While the MM includes some up-market facilities, the essential asset is associated with the rural, relaxed, friendly, and slower-paced lifestyle the area offers (van Zyl – pers. comm).

Of specific relevance to the INCA proposal, two wine farms, which form part of the recently established West Coast Wine Route, are located along the R362 Holrivier road, namely Bellpost and Cape Rock (viz. on either side of the Sishen-Saldanha railway line. These facilities are located towards Vredendal. Current dedicated visitor numbers along the Holrivier road appear to be low (van der Westhuizen – pers. comm).

As indicated in Section 3.2.3, no significant tourism traffic is currently associated with the Holrivier Road. The road is also not considered of great scenic significance. In addition, the sense of place associated with the section of the road located to the south of the INCA site is impacted by Eskom's large Juno substation and associated power lines and the Sishen-Saldanha railway line which passes over the road. Potential exposure to established and potential tourism receptors along the Holrivier road does not therefore appear to be a significant issue. In addition, as discussed in Section 4, the potential visual impacts are further mitigated by the site's distance from the road (~0.8 km), and the low height of proposed PVSEF structures and infrastructure.

### 3.5 LOCAL LAND USES

As indicated in Figure 3.1, the proposed site is located in the north-western corner of a larger farming unit, namely Gordonia farm. Gordonia is located on either side of the R362, with productive activities located mainly on the portion to the south of the R362. The light blue line indicates the Saldanha-Sishen railway line; the grey-blue line the Vredendal-Koekenaap railway line, and the red line the R362 Holrivier Road. The Juno substation is located ~ 1.5 km to the south of the site (Photograph 3.3).

Gordonia is wholly bordered by Liebendal Farm to the west. The relevant boundary extends from the northern bank of the Olifant's River, to just to the north of the INCA site. The land located to the north of both Gordonia and Liebendal Farm consists of parcels of vacant state land.



**Figure 3.1: INCA site (pink) on Gordonia Farm (green outline)**

Gordonia covers an area of ~ 1000 ha and is owned by the Jan Frederick Zandberg Testamentêre Trust. Ms. Laetitia Zanderg currently resides on the farm. A number of secondary farm houses are located on the farm (currently leased out), including 12 inhabited labourer's houses. All the relevant structures are located on the portion of Gordonia south of the R362, and >2.5 km from the INCA site.



**Photograph 3.3: View from R362 looking north east. Juno substation on the left (south) and site on the right (north)**

Key agricultural activities consist of vineyard (leased out) and vegetable cropping activities (tunnels and irrigation). Due to marginal carrying capacities and on-going stock theft, the sheep farming component has dwindled to a small flock (<30 ewes). A small ostrich farming operation on the portion located north of the R362, including the INCA site, was abandoned a number of years ago. A few birds remain, but neither sheep nor ostrich farming components are considered to be of productive significance. Gordonia currently employs ~ 12 permanent workers (Zandberg – pers. comm). The proposed INCA PVSEF site will take up ~10% of Gordonia Farm. The site is located on sandy soils and has traditionally been used for grazing (sheep and ostriches). The soils are potentially suitable for irrigation, but availability of water is a key limiting factor (TerraSoil; 2011). In this regard, distance from the Olifants River and the availability of abundant soils located in greater proximity to the river precludes development in the foreseeable future (Zandberg – pers. comm). In addition, development of the site would require pumping infrastructure which would need to cross the R362 and the Koekenaap-Vredendal railway line. The site is therefore not considered of suitable for the farming. No farm dwellings are located on the proposed site (Zandberg – pers. comm).

Liebendal Farm is owned by the De Waal family, and forms part of one of the larger land holdings in the area, including Altona Farm towards the west (Lutzville direction). The land use patterns on Liebendal are similar to those on Gordonia and include irrigated vineyard and vegetable cropping and sheep farming (Photograph

3.4). The bulk of Liebendal is located to the south of the R362, and contains larger tracts of irrigated land than Gordonia. Mr. Herman de Waal currently resides on the farm. Liebendal currently employs 5 full time employees who live on the farm with their families. The farm dwellings and farming activities on Liebendal are located in proximity to the Olifants River. In terms of visibility, the INCA site is screened by the natural topography of the area, specifically northern bank of the Olifants River.



**Photograph 3.4: View south-east across portion of the Liebendal irrigated area**

The portion to the north of the R362, the so-called “veldgrond” portion, adjacent to the INCA site is currently used on a rotational basis for grazing purposes. The relevant portion is however small, and the veld of very limited carrying capacity (De Waal - pers. comm).

In terms of power lines, all of the power line route alternatives only impact on Gordonia Farm. As indicated above, the relevant portion of Gordonia consists of low potential land, with very limited stock carrying capacity, and is not currently being used for any productive purposes.

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## **SECTION 4: ASSESSMENT OF KEY ISSUES**

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### **4.1 INTRODUCTION**

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

- The Social Scoping Report prepared for the Scoping phase (Barbour and van der Merwe; 2011);
- Review of project related information, including other specialist studies;
- Interviews with key interested and affected parties;
- Experience/ familiarity of the authors with the area and local conditions;
- Experience with similar projects;

The assessment section is divided into the following sections:

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

Section 4 also comments on the potential health impacts associated with SEFs.

### **4.2 ASSESMENT OF POLICY AND PLANNING FIT**

As indicated in Section 1.6, legislative and policy context plays an important role in identifying and assessing the potential social impacts associated with a proposed development. In this regard a key component of the SIA process is to assess the proposed development in terms of its fit with key planning and policy documents.

The review of the relevant planning and policy documents was undertaken as a part of the SIA. The key documents reviewed included:

- The National Energy Act (2008);
- The White Paper on the Energy Policy of the Republic of South Africa (December 1998);
- The White Paper on Renewable Energy (November 2003);
- Integrated Resource Plan (IRP) for South Africa (2010-2030);
- White Paper on Sustainable Energy for the Western Cape (Final Draft, 2008);
- The Western Cape Draft Strategic Plan (2010);
- Climate Change Strategy and Action Plan for the Western Cape (2008).
- Western Cape Provincial Spatial Development Framework (2009);
- Western Cape Amended Zoning Scheme Regulations for the establishment of Commercial Renewable Energy Facilities (2011);

- Matzikama Integrated Development Plan (2007-2011);
- Matzikama Tourism Development Strategy (2010-2015).
- Matzikama Spatial Development Framework (2010).

The findings of the review indicated that solar energy was strongly supported at a national and local level. At a national level the White Paper on Energy Policy (1998) notes:

- Renewable resources generally operate from an unlimited resource base and, as such, can increasingly contribute towards a long-term sustainable energy future;
- The support for renewable energy policy is guided by a rationale that South Africa has a very attractive range of renewable resources, particularly **solar** and wind and that renewable applications are in fact the least cost energy service in many cases; more so when social and environmental costs are taken into account.

The IRP 2010 also allocates 43% of energy generation in South Africa to renewables. At a provincial level wind and solar are identified as suitable renewable energy options for the Western Cape. In this regard the 2009 Spatial Development Plan notes that 25% of the Province's energy generation should consist of renewables by 2020. It should also be noted that meeting the requirements outlined in the 2011 LUPO Regulations for REF's is mandatory (e.g. decommissioning/ rehabilitation fund; mitigation of disturbances, etc).

At a local level, the renewable energy sector is not explicitly identified as a sector or initiative in the current MM policy and planning documents. However, the MM LED Manager indicated that the MM recognizes the potential benefits associated with the development of PVSEFs in the MM. These benefits include long term employment and training opportunities as well as potential benefits associated with contributions to an envisaged multi-stakeholder MM community development fund (Philips – pers. comm).

The findings of the review of the relevant policies and documents pertaining to the energy sector therefore indicate that solar energy and the establishment of solar energy plants are supported at a national, provincial, and local level. It is therefore the opinion of the authors that the establishment of a PVSEF on the proposed site is supported by national, provincial and local policies and planning documents. However, the provincial and local policy and planning documents also make reference to the importance of tourism and the regions natural resources. Care therefore needs to be taken to ensure that the development of large renewable energy projects, such as the proposed solar energy facility do not impact on the region's natural resources and the tourism potential of the Province.

### **4.3 CONSTRUCTION PHASE SOCIAL IMPACTS**

The key social issues associated with the construction phase are the following:

#### **Potential positive impacts**

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

#### **Potential negative impacts**

- Impacts associated with the presence of construction workers on site

- Influx of job seekers to the area;
- Loss of farm labour to the construction phase;
- Increased risk of stock theft, poaching and damage to farm infrastructure associated with presence of construction workers on the site
- Increased risk of veld fires associated with construction-related activities
- Threat to safety and security of farmers associated with the presence of construction workers on site
- Impact of heavy vehicles, including damage to roads, safety, noise and dust
- Potential loss of grazing land associated with construction-related activities.

#### **Potential positive impacts**

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

#### **Potential negative impacts**

- Impacts associated with the presence of construction workers on local communities;
- Impacts related to the potential influx of job-seekers;
- Loss of farm labour to the construction phase;
- Increased risks to livestock and farming infrastructure associated with the construction related activities and presence of construction workers on the INCA site;
- Noise, dust and safety impacts of construction related activities and vehicles;
- Damage to and loss of farmland;

Annexure C contains the management plan for addressing social impacts.

#### **4.3.1 Creation of local employment, training, and business opportunities**

Based on the information from other PVSEF projects the construction phase is expected to extend over a period 10-12 months and create approximately 100 employment opportunities during peak construction. The work associated with the construction phase will be undertaken by contractors and will include the establishment of the PVSEF and the associated components, including, access roads, substation, services and power line. It is anticipated that approximately 55 % (55) of the employment opportunities will be available to low skilled workers (construction labourers, security staff etc.), 30% (30) for semi-skilled workers (drivers, equipment operators etc) and 15% (15) for skilled personnel (engineers, land surveyors, project managers etc). Members from the local communities are likely to be in a position to qualify for the majority of the low skilled and some of the semi-skilled employment opportunities. The majority of these employment opportunities are also likely to accrue to Historically Disadvantaged (HD) members from the local community, specifically residents of Koekenaap, Lutzville West, Uitkyk and Vredendal North. Given high local unemployment levels and limited job opportunities in the area, this will represent a significant, if localised, social benefit. The remainder of the semi-skilled and majority of the skilled employment opportunities are likely to be associated with the contractors appointed to construct the WEF and associated infrastructure.

The capital expenditure associated with the construction phase will be in the region of R 750 million. In terms of business opportunities for local companies, expenditure during the construction phase will create business opportunities for the regional and

local economy. However, given the technical nature of the project and high import content associated with PVSEFs opportunities for the local economy and the towns of Vredendal, Lutzville and Koekenaap are likely to be limited. However, opportunities are likely to exist for local contractors and engineering companies in Vredendal. Implementing the enhancement measures listed below can enhance these opportunities.

The total wage bill for the 10-12 month construction phase will be in the region of R 10 million. A percentage of the wage bill will be spent in the local economy and will create opportunities for local businesses in Vredendal, Lutzville and Koekenaap. The sector of the local economy that is most likely to benefit from the proposed development is the local service industry. The potential opportunities for the local service sector would be linked to accommodation, catering, cleaning, transport and security, etc. associated with the construction workers on the site. The benefits to the local economy will however be confined to the construction period (8-12 months).

The implementation of the proposed enhancement measures listed below would also enable the establishment of the proposed PVSEF to support co-operation between the public and private sectors which would support local economic development in the Matzikama region.

In terms of training and skills development, INCA Energy has indicated that training and skills development will be provided by the contractors appointed to manage the construction phase. However, the majority of benefits are likely to accrue to personnel employed by the relevant contractors. In the absence of specific commitments from the developer to maximise local employment targets the potential for meaningful skills development and training for members from the local communities are likely to be limited.

The hospitality industry in the local towns is also likely to benefit from the provision of accommodation and meals for professionals (engineers, quantity surveyors, project managers, product representatives etc.) and other (non-construction) personnel involved on the project. Experience from other large construction projects indicates that the potential opportunities are not limited to on-site construction workers but also to consultants and product representatives associated with the project.

It should however be noted that a number of interviewees have indicated that housing rental stock in both Vredendal and Lutzville is extremely limited (Phillips, Smit, van der Westhuizen, van Zyl - pers. comm). The MM IDP/ LED Manager indicated that the contributions for various REF and mining sector developments in the MM could be used to address the housing shortage (Phillips – pers. comm).

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

<b>Nature:</b> Creation of employment and business opportunities during the construction phase		
	<b>Without Mitigation</b>	<b>With Enhancement</b>
<b>Extent</b>	Local – Regional (2)	Local – Regional (4)
<b>Duration</b>	Very short term (1)	Short term (2)
<b>Magnitude</b>	Low (4)	Moderate (6)
<b>Probability</b>	Highly probable (4)	Highly probable (4)
<b>Significance</b>	Medium (32)	Medium (48)
<b>Status</b>	Positive	Positive
<b>Reversibility</b>	N/A	N/A
<b>Irreplaceable loss of resources?</b>	N/A	N/A
<b>Can impact be enhanced?</b>	Yes	
<b>Enhancement:</b> See below		
<b>Cumulative impacts:</b> Opportunity to up-grade and improve skills levels in the area.		
<b>Residual impacts:</b> Improved pool of skills and experience in the local area.		

### Assessment of No Go option

There is no impact, as the current status quo will be maintained. The potential employment and economic benefits associated with the construction of the proposed PVSEF would however be forgone. The potential opportunity costs in terms of local capital expenditure, employment, skills development and opportunities for local business are therefore regarded as a negative. Potential opportunity costs would be greatest with regards to local employment provision and opportunities for the local service sector.

### Recommended enhancement measures

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

#### Employment

- Where reasonable and practical, INCA Energy should appoint local contractors and implement a 'locals first' policy, especially for semi and low-skilled job categories. However, due to the low skills levels in the area, the majority of skilled posts are likely to be filled by people from outside the area.
- Where feasible, efforts should be made to employ local contractors that are compliant with Black Economic Empowerment (BEE) criteria;
- Before the construction phase commences INCA Energy should meet with representatives from the Matzikama Local Municipality to establish the existence of a skills database for the area. If such a database exists it should be made available to the contractors appointed for the construction phase.
- The local authorities, community representatives, and organisations on the interested and affected party database should be informed of the final decision regarding the project and the potential job opportunities for locals and the employment procedures that INCA Energy intends following for the construction phase of the project.

- Where feasible, training and skills development programmes for locals should be initiated prior to the initiation of the construction phase.
- The recruitment selection process should seek to promote gender equality and the employment of women wherever possible.

### **Business**

- INCA Energy should liaise with the Matzikama Local Municipality with regards the establishment of a database of local companies, specifically BEE companies, which qualify as potential service providers (e.g. construction companies, catering companies, waste collection companies, security companies etc.) prior to the commencement of the tender process for construction contractors. These companies should be notified of the tender process and invited to bid for project-related work;
- Where possible, INCA Energy should assist local BEE companies to complete and submit the required tender forms and associated information.
- The Matzikama Local Municipality, in conjunction with the local Chamber of Commerce and representatives from the local hospitality industry, should identify strategies aimed at maximising the potential benefits associated with the project.

Note that while preference to local employees and companies is recommended, it is recognised that a competitive tender process may not guarantee the employment of local labour for the construction phase.

### **4.3.2 Impact of construction workers on local communities**

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

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

In terms of potentially impacts, local farm workers and residents of Vredendal and Lutzville are potentially at risk. The potential risk to local farm workers will be mitigated by the relatively small number of construction workers (80) and the fact that no construction workers will be accommodated on the site. The potential risk to local farm workers is therefore not regarded as a significant issue.

The potential risk to local residents in Vredendal and Lutzville will be mitigated by INCA Energy's commitment to implementing a local employment policy, specifically for the low and semi-skilled employment opportunities associated with the construction phase. Employing members from the local community to fill the low-skilled job categories will reduce the risk and mitigate the potential impacts on the local communities. These workers will be from the local community and form part of the local family and social network and, as such, the potential impact will be low. The use of local residents to fill the low skilled job categories will also reduce the need to

house construction workers on the site. As indicated above, INCA Energy has indicated that no construction personnel will be accommodated on the site. However, due to the potential mismatch of skills and low education levels, the potential employment opportunities for the members from these local communities may be low. While the risks associated with construction workers at a community level will be low, at an individual and family level they may be significant, especially in the case of contracting a sexually transmitted disease or an unplanned pregnancy. However, given the nature of construction projects it is not possible to totally avoid these potential impacts at an individual or family level.

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

<b>Nature:</b> Potential impacts on family structures and social networks associated with the presence of construction workers		
	<b>Without Mitigation</b>	<b>With Mitigation</b>
<b>Extent</b>	Local (2) (Rated as 2 due to potential severity of impact on local communities)	Local (1) (Rated as 1 due to potential severity of impact on local communities)
<b>Duration</b>	Very short term for community as a whole (1) Long term-permanent for individuals who may be affected by STDs etc. (5)	Very short term for community as a whole (1) Long term-permanent for individuals who may be affected by STDs etc. (5)
<b>Magnitude</b>	Low for the community as a whole (4) High-Very High for specific individuals who may be affected by STDs etc. (10)	Low for community as a whole (4) High-Very High for specific individuals who may be affected by STDs etc. (10)
<b>Probability</b>	Probable (3)	Probable (3)
<b>Significance</b>	Low for the community as a whole (21) Moderate-High for specific individuals who may be affected by STDs etc. (51)	Low for the community as a whole (18) Moderate-High for specific individuals who may be affected by STDs etc. (48)
<b>Status</b>	Negative	Negative
<b>Reversibility</b>	No in case of HIV and AIDS	No in case of HIV and AIDS
<b>Irreplaceable loss of resources?</b>	Yes, if people contract HIV/AIDS. Human capital plays a critical role in communities that rely on farming for their livelihoods	
<b>Can impact be mitigated?</b>	Yes, to some degree. However, the risk cannot be eliminated	
<b>Mitigation:</b> See below		
<b>Cumulative impacts:</b> Impacts on family and community relations that may, in some cases, persist for a long period of time. Also in cases where unplanned / unwanted pregnancies occur or members of the community are infected by an STD, specifically HIV and or AIDS, the impacts may be permanent and have long term to permanent cumulative impacts on the affected individuals and/or their families and the community.		
<b>Residual impacts:</b> See cumulative impacts.		

### **Assessment of No Go option**

There is no impact as the current status quo would be maintained. The potential positive impacts on the local economy associated with the additional spending by construction workers in the local economy will also be lost.

### **Recommended mitigation measures**

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

- Where possible, INCA should make it a requirement for contractors to implement a 'locals first' policy for construction jobs, specifically for semi and low-skilled job categories;
- INCA should consider the establishment of a Monitoring Forum (MF) in order to monitor the construction phase and the implementation of the recommended mitigation measures. The MF should be established before the construction phase commences, and should include key stakeholders, including representatives from local communities, local Matzikama Councillors, farmers and the contractor(s). The MF should also be briefed on the potential risks to the local community associated with construction workers;
- INCA and the contractor(s) should, in consultation with representatives from the MF, develop a code of conduct for the construction phase. The code should identify which types of behaviour and activities are not acceptable. Construction workers in breach of the code should be dismissed. All dismissals must comply with the South African labour legislation;
- INCA and the contractor should implement an HIV/AIDS awareness programme for all construction workers at the outset of the construction phase;
- The movement of construction workers on and off the site should be closely managed and monitored by the contractors. In this regard the contractors should be responsible for making the necessary arrangements for transporting workers to and from site over weekends or after hours;
- The contractors should make the necessary arrangements for allowing workers from outside the area to return home over weekends and/ or on a regular basis. This would reduce the risk posed to local family structures and social networks;
- It is recommended that no construction workers, with the exception of security personnel, should be permitted to stay over-night on the site.

### **4.3.3 Influx of job seekers**

Large construction projects tend to attract people to the area in the hope that they will secure a job, even if it is a temporary job. These job seekers can in turn become "economically stranded" in the area or decide to stay on irrespective of finding a job or not. While the proposed INCA Vredendal PVSEF on its own does not constitute a large construction project, the proposed establishment of a number of solar and wind energy projects in the Matzikama Municipality is likely to attract job seekers to the area. As in the case of construction workers employed on the project, the actual presence of job seekers in the area does not in itself constitute a social impact. However, the manner in which they conduct themselves can impact on the local community.

The two main areas of concern are associated with the influx of job seekers:

- Impacts on existing social networks and community structures;

- Competition for housing, specifically low cost housing;
- Competition for scarce jobs;
- Increase in incidences of crime. The concern is that these job seekers may not leave town immediately and, in some cases, may stay indefinitely.

These issues are similar to the concerns associated with the presence of construction workers and are discussed in Section 4.4.2. However, in some instances the potential impact on the community may be greater given that they are unlikely to have accommodation and may decide to stay on in the area. In addition, they will not have a reliable source of income. The risk of crime associated with the influx of job seekers it therefore likely to be greater.

Experience from other projects has also shown that the families of job seekers may also accompany individual job seekers or follow them at a later date. In many cases the families of the job seekers that become “economically stranded” and the construction workers that decided to stay in the area, subsequently moved to the area. The influx of job seekers to the area and their families can also place pressure on the existing services in the area, specifically low income housing. In addition to the pressure on local services the influx of construction workers and job seekers can also result in competition for scarce employment opportunities. Further secondary impacts included increase in crime levels, especially property crime, as a result of the increased number of unemployed people. These impacts can result in increased tensions and conflicts between local residents and job seekers from outside the area.

The findings of the SIA indicate that economically motivated in-migration and subsequent labour stranding is a problem in the Olifants River Valley area. Current in-migration is mainly associated with perceived or real opportunities in the local irrigation agriculture and mining sectors. A significant proportion of migration flows is seasonal, and associated with agriculture.

The key lesson from other large construction projects is the importance of a developing and implementing a well-structured recruitment strategy aimed at employing locals and minimising the number of job seekers moving into the area.

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

<b>Nature:</b> Potential impacts on family structures, social networks and community services associated with the influx of job seekers		
	<b>Without Mitigation</b>	<b>With Mitigation</b>
<b>Extent</b>	Local (3)	Local (2)
<b>Duration</b>	Permanent (5) (For job seekers that stay on the town)	Permanent (5) (For job seekers that stay on the town)
<b>Magnitude</b>	Low for the community as a whole (4) High-Very High for specific individuals who may be affected by STD's etc. (10)	Minor for community as a whole (2) High-Very High for specific individuals who may be affected by STD's etc. (10)
<b>Probability</b>	Probable (3)	Probable (3)
<b>Significance</b>	Medium for the community as a whole (36) Medium -High for specific individuals	Low for the community as a whole (27) Medium-High for specific individuals

	who may be affected by STD's etc. (54)	who may be affected by STD's etc. (51)
<b>Status</b>	Negative	Negative
<b>Reversibility</b>	No in case of HIV and AIDS	No in case of HIV and AIDS
<b>Irreplaceable loss of resources?</b>	Yes, if people contract HIV/AIDS. Human capital plays a critical role in communities that rely on farming for their livelihoods	
<b>Can impact be mitigated?</b>	Yes, to some degree. However, the risk cannot be eliminated	
<b>Mitigation:</b> See below		
<b>Cumulative impacts:</b> Impacts on family and community relations that may, in some cases, persist for a long period of time. Also in cases where unplanned / unwanted pregnancies occur or members of the community are infected by an STD, specifically HIV and or AIDS, the impacts may be permanent and have long term to permanent cumulative impacts on the affected individuals and/or their families and the community.		
<b>Residual impacts:</b> See cumulative impacts.		

#### **Recommended mitigation measures**

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

- INCA Energy, in consultation with the Matzikama Local Municipality, should investigate the option of establishing a Local Community Forum to monitor and identify potential problems that may arise due to the influx of job seekers to the area. The Forum should also include the other proponents of solar energy projects in the area;
- Implement a policy that no employment will be available at the gate.

The Matzikama LED Manager noted that the MM supports a recruitment model based on:

- Setting and pursuing meaningful local and MM recruitment targets;
- A policy of "locals first", specifically with regard to unskilled and low skilled opportunities;
- No recruitment at the gate;
- Meaningful consultation with the relevant local communities, including presentations by the developer of specifically opportunities and skills requirements associated with the project;
- Meaningful skills training in advance of the project (Philips – pers. comm).

#### **4.3.4 Loss of farm labour to the construction phase**

Experience from other projects indicates that the loss of farm workers is an issue of concern. In most instances local farmers are unlikely to be in a position to compete with the salaries offered by the solar energy companies during the construction phase. As a result farm labourers may be tempted to resign from their current positions on farms. The loss of skilled and experienced farm labour would have a negative impact on local farmers.

While the proposed INCA Vredendal PVSEF on its own is unlikely to result in a significant loss of farm labour, the proposed establishment of a number of solar and wind energy projects in the Matzikama Municipality has the potential to impact on the farming sector. However, at the end of the day farm labour can be replaced. The potential impacts on farm operations are therefore likely to be temporary.

The potential impacts for the affected farmers associated with the loss of permanent farm labour to the construction phase are exacerbated by the security of tenure that permanent farm labourers enjoy in terms of the Extension of Security and Tenure Act (ESTA). Those farm labourers which are eligible under ESTA and who take up jobs during the construction phase will be entitled stay on in their houses on the farms in question. The net effect is that the farmer may have to incur the costs associated with the construction of new dwellings for new labour appointed to replace the labour lost to the construction phase. The farmer may also have to continue subsidizing services such as potable water to people who are no longer in his employ.

The farm workers that take up jobs during the construction phase are also at risk. While some farm workers may be re-employed once the construction has been completed, others may not be so fortunate. The low education levels associated with the farm worker community would effectively mean that alternative employment opportunities outside the agricultural sector will not be accessible to them. These farm workers and their families therefore stand to be negatively impacted upon in the medium to long term.

**Table 4.4: Assessment of loss of farm labour to the construction phase**

<b>Nature:</b> Potential impact on local farmers associated with loss of farm labour to the construction phase		
	<b>Without Mitigation</b>	<b>With Mitigation</b>
<b>Extent</b>	Local and Regional (3)	Local and Regional (3)
<b>Duration</b>	Short term (2) (Assumed that farm labour can be replaced)	Short term (2) (Assumed that farm labour can be replaced)
<b>Magnitude</b>	Low (4)	Low (4)
<b>Probability</b>	Probable (3)	Probable (3)
<b>Significance</b>	Low (27)	Low (27)
<b>Status</b>	Negative	Negative
<b>Reversibility</b>	Yes, if farm workers return of are replaced	Yes, if farm workers return of are replaced
<b>Irreplaceable loss of resources?</b>	No	No
<b>Can impact be mitigated?</b>	Yes, to some degree. However, the risk cannot be eliminated	
<b>Mitigation:</b> See below		
<b>Cumulative impacts:</b> Impacts on farm operations due to loss of experienced farm labour		
<b>Residual impacts:</b> See cumulative impacts.		

### Recommended mitigation measures

While INCA Energy could liaise with local farmers in the area and undertake not to employ farm worker were possible, it is not possible to prevent farm workers from applying for work in other sectors. There are therefore no recommended mitigation measures. Also it is assumed that farm labour can be replaced. The impacts would therefore be temporary.

Farm workers who apply for construction related work should also be informed that the nature of the work is temporary. In addition they should be informed of the potential negative consequences of their actions, which include the potential loss of

### 4.3.5 Increased risk to livestock and farm infrastructure

The potential risk applies to local farms in the area, specifically Gordonia and Liebendal Farm. The presence on and movement of construction workers on and off the site poses a potential threat to farm infrastructure, such as fences and gates, which may be damaged. Stock losses may also result from gates being left open and/or fences being damaged. Veld fires pose a potential risk to pasture, while plastic waste may pose a risk to livestock if ingested. Stock theft in the area is an on-going problem. This is largely due to the proximity of the affected farms to the R362 and local urban communities.

**Table 4.5: Assessment of impact of stock theft and damage to farm infrastructure**

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

### Assessment of No-Go option

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

### Recommended mitigation measures

Key mitigation measures include:

- INCA should enter into an agreement with the local farmers in the area whereby damages to farm property etc. during the construction phase will be compensated for. The agreement should be signed before the construction phase commences;
- INCA should consider the option of establishing a MF (see above) that includes local farmers and develop a Code of Conduct for construction workers. This committee should be established prior to commencement of the construction phase. The Code of Conduct should be signed by the proponent and the contractors before the contractors move onto site;
- INCA should hold contractors liable for compensating farmers and communities in full for any stock losses and/or damage to farm infrastructure that can be linked to construction workers on Gordonia or Liebendal. This should be contained in the Code of Conduct to be signed between the proponent, the contractors and neighbouring landowners. The agreement should also cover losses and costs associated with fires caused by construction workers or construction related activities (see below);
- The EMP must outline procedures for managing and storing waste on site, specifically plastic waste that poses a threat to livestock if ingested;
- Contractors appointed by INCA must ensure that all workers are informed at the outset of the construction phase of the conditions contained on the Code of Conduct, specifically consequences of stock theft and trespassing on adjacent farms.
- Contractors appointed by INCA must ensure that construction workers who are found guilty of stealing livestock and/or damaging farm infrastructure are dismissed and charged. This should be contained in the Code of Conduct. All dismissals must be in accordance with South African labour legislation;
- The housing of construction workers on the site should be strictly limited to security personnel.

#### 4.3.6 Impact of construction vehicles

The movement of heavy construction vehicles during the construction phase has the potential to damage roads and create noise, dust, and safety impacts for other road users and local communities in the area. Access to the site will be via the R 362.

The findings of the SIA indicate that the R362 is not heavily utilized. The social impacts associated with the movement of construction related traffic along R362 are therefore likely to be low. In addition, unlike wind energy projects, the transportation requirements for PVSEF's do not involve large, abnormal loads.

**Table 4.6: Assessment of the impacts associated with construction vehicles**

<b>Nature:</b> Potential noise, dust and safety impacts associated with movement of construction related traffic to and from the site		
	<b>Without Mitigation</b>	<b>With Mitigation</b>
<b>Extent</b>	Local (2)	Local (1)
<b>Duration</b>	Very Short Term (1)	Very Short Term (1)
<b>Magnitude</b>	Low (4)	Minor (2)
<b>Probability</b>	Probable (3)	Probable (3)

<b>Significance</b>	Low (21)	Low (12)
<b>Status</b>	Negative	Negative
<b>Reversibility</b>	Yes	
<b>Irreplaceable loss of resources?</b>	No	No
<b>Can impact be mitigated?</b>	Yes	
<b>Mitigation:</b> See below		
<b>Cumulative impacts:</b> If damage to roads is not repaired then this will affect the farming activities in the area and result in higher maintenance costs for vehicles of local farmers and other road users. The costs will be borne by road users who were no responsible for the damage.		
<b>Residual impacts:</b> See cumulative impacts		

### **Assessment of No-Go option**

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

### **Recommended mitigation measures**

As indicated above, INCA Energy should enter into an agreement with the affected landowners whereby the company will compensate for damages. This includes losses associated with damage to local internal farm roads that are affected by the site. In addition, the potential impacts associated with heavy vehicles and dust can be effectively mitigated. The aspects that should be covered include:

- The contractor must ensure that damage caused to roads by the construction related activities, including heavy vehicles, is repaired before the completion of the construction phase. The costs associated with the repair must be borne by the contractor;
- Dust suppression measures must be implemented for heavy vehicles such as wetting of gravel roads on a regular basis and ensuring that vehicles used to transport sand and building materials are fitted with tarpaulins or covers;
- All vehicles must be road-worthy and drivers must be qualified and made aware of the potential road safety issues and need for strict speed limits.

#### **4.3.7 Damage to and loss of farmland**

The activities associated with the construction phase have the potential to result in the loss of land available for grazing and other agricultural activities. The proposed INCA PVSEF site will take up ~10% of Gordonia Farm. The site is located on sandy soils and has traditionally been used for grazing (sheep and ostriches). The soils are potentially suitable for irrigation, but availability of water is a key limiting factor (TerraSoil; 2011). In this regard the distance from the Olifants River and the availability of abundant soils located in greater proximity to the river precludes development in the foreseeable future (Zandberg – pers. comm). In addition, development of the site would require pumping infrastructure which would need to cross the R362 and the Koekenaap-Vredendal railway line. The site is therefore not considered of suitable for the farming. No farm dwellings are located on the proposed site (Zandberg – pers. comm).

In addition, the final disturbance footprint can also be reduced by careful site design and placement of components. The impact on farmland associated with the

construction phase can therefore be mitigated by minimising the footprint of the construction related activities and ensuring that disturbed areas are fully rehabilitated on completion of the construction phase. Recommended mitigation measures are outlined below.

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

<b>Nature:</b> The activities associated with the construction phase, such as establishment of access roads and the construction camp, movement of heavy vehicles and preparation of foundations for the PVSEF and power lines will damage farmlands and result in a loss of farmlands for future farming activities.		
	<b>Without Mitigation</b>	<b>With Mitigation</b>
<b>Extent</b>	Local (1)	Local (1)
<b>Duration</b>	Long term-permanent if disturbed areas are not effectively rehabilitated (5)	Short term if damaged areas are rehabilitated (1)
<b>Magnitude</b>	Minor (2)	Minor (2)
<b>Probability</b>	Highly Probable (4)	Highly Probable (4)
<b>Significance</b>	Moderate (32)	Low (16)
<b>Status</b>	Negative	Negative
<b>Reversibility</b>	Yes, disturbed areas can be rehabilitated	Yes, disturbed areas can be rehabilitated
<b>Irreplaceable loss of resources?</b>	Yes, loss of farmland. However, disturbed areas can be rehabilitated	Yes, loss of farmland. However, disturbed areas can be rehabilitated
<b>Can impact be mitigated?</b>	Yes, however, loss of farmland cannot be avoided	Yes, however, loss of farmland cannot be avoided
<b>Mitigation:</b> See below		
<b>Cumulative impacts:</b> Overall loss of farmland could affect the livelihoods of the affected farmers, their families, and the workers on the farms and their families. However, disturbed areas can be rehabilitated.		
<b>Residual impacts:</b> See cumulative impacts.		

#### **Assessment of No-Go option**

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

#### **Recommended mitigation measures**

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

- The footprint associated with the construction related activities (access roads, construction platforms, workshop etc.) should be minimised;
- An Environmental Control Officer (ECO) should be appointed to monitor the establishment phase of the construction phase;
- All areas disturbed by construction related activities, such as access roads on the site, construction platforms, workshop area etc., should be rehabilitated at the end of the construction phase;
- The implementation of a rehabilitation programme should be included in the terms of reference for the contractor/s appointed. The specifications for the

rehabilitation programme should be drawn up the Environmental Consultants appointed to undertake the EIA (Savannah Environmental);

- The implementation of the Rehabilitation Programme should be monitored by the ECO.

#### **4.4 OPERATIONAL PHASE SOCIAL IMPACTS**

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

##### **Potential positive impacts**

- Creation of employment and business opportunities. The operational phase will also create opportunities for skills development and training;
- The establishment of renewable energy infrastructure.

##### **Potential negative impacts**

- Influx of job seekers to the area;
- Loss of farm workers to jobs associated with the operational phase;
- Impact on productive agricultural land;
- The visual impacts and associated impact on sense of place;
- Potential impact on tourism.

Annexure C contains the management plan for addressing social impacts.

##### **4.4.1 Creation of employment and business opportunities and support for local economic development**

Based on information from other PVSEF projects the proposed INCA PVSEF will create ~ 50 employment opportunities for over a 25-30 year period. Of this total approximately 40 will be low skilled, 8 semi-skilled and 2 high skilled positions. The annual wage bill for the operational phase will be ~ R 4.2 million. The majority of the employment opportunities associated with the operational phase are likely to benefit HD members of the community. However, given that the solar energy sector in South Africa is relatively new, the skilled positions may need to be filled by people from other parts of South Africa or even overseas.

It will also be possible to increase the number of local employment opportunities through the implementation of a skills development and training programme linked to the operational phase. Such a programme would support the strategic goals of promoting local employment and skills development contained in the Matzikama IDP.

Given the location of the proposed facility the majority of permanent staff is likely to reside in the towns of Lutzville and Vredendal. In terms of accommodation options, a percentage of the non-local permanent employees may purchase houses in one of these towns, while others may decide to rent. Both options would represent a positive economic benefit for the region. In addition, a percentage of the monthly wage bill earned by permanent staff would be spent in the regional and local economy, which will benefit local businesses in these towns. The benefits to the local economy will extend over the 20-30 year operational lifespan of the project.

The local hospitality industry in Lutzville and Vredendal is also likely to benefit from the operational phase. These benefits are associated with site visits by company staff members and other professionals (engineers, technicians etc.) who are involved in the company and the project but who are not linked to the day-to-day operations.

Due the large number of PVSEFs proposed in the MM area it is recommended that the Emthanjeni LM follows the example of the Theeswaterskloof LM in the Western Cape and investigate the establishment of a Community Development Trust/Fund. In this regard the the Theeswaterskloof LM has made it a requirement for all potential renewable energy producers to become a member of and contribute to a Community Development Trust/Fund. In terms of the structure of the Trust, a percentage of the revenue from the operation is allocated to projects identified in the Theeswaterskloof IDP. Of this total, 50% of the revenue is allocated to infrastructure projects and the remaining 50% to social projects and initiatives, such as skills development and training. It is recommended that a similar model be investigated by the Emthanjeni LM. The establishment of a Community Development Trust/Fund would also be in line with the socio-economic development requirements set out in the request for proposal bid documents for renewable energy projects released by the Department of Environmental Affairs.

The creation of sustainable employment opportunities for the MM communities has been identified as one of the key priorities of the MM in a number of key policy documents. Current unemployment in the Olifants River settlements is estimated at 30%. This figure is even higher when seasonal unemployment, linked to quiet months in agriculture, is included. Remittances and social grants therefore represent important sources of income for local communities.

In this regard the Matzikama Municipality is considering the establishment of a multi-stakeholder MM Community Development Fund (Phillips – pers. comm). The objective is to establish a single MM Community Fund which will be linked to contributions from the mining sector and proposed renewable energy projects planned for the area. The Trust would be co-ordinated by the MM, however, the trustees would be made up of representatives from all stakeholder groups, including the relevant private sector contributors. The funds generated for the fund would be ring-fenced and used to support local economic development in the MM (Phillips – pers. comm). The objective of the fund is to rationalize the process by creating a single fund.

**Table 4.8: Impact assessment of employment and business creation opportunities**

<b>Nature:</b> Creation of employment and business opportunities associated with the operational phase		
	<b>Without Mitigation</b>	<b>With Enhancement<sup>11</sup></b>
<b>Extent</b>	Local and Regional (2)	Local and Regional (3)
<b>Duration</b>	Long term (4)	Long term (4)
<b>Magnitude</b>	Low (4)	Moderate (6)
<b>Probability</b>	Probable (3)	Definite (5)
<b>Significance</b>	Medium (30)	High (65)
<b>Status</b>	Positive	Positive
<b>Reversibility</b>	N/A	
<b>Irreplaceable</b>	No	

<sup>11</sup> This assumes the establishment of some form of Community Development Trust/Fund

<b>loss of resources?</b>		
<b>Can impact be enhanced?</b>	Yes	
<b>Enhancement:</b> See below		
<b>Cumulative impacts:</b> Creation of permanent employment and skills and development opportunities for members from the local community and creation of additional business and economic opportunities in the area		
<b>Residual impacts:</b> See cumulative impacts		

### **Assessment of No-Go option**

There is no impact as it maintains the current status quo. However, the potential opportunity costs in terms of the loss of employment and skills and development training would be lost which would also represent a negative impact.

### **Recommended enhancement measures**

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

- INCA Energy should implement a training and skills development programme for locals during the first 5 years of the operational phase. The aim of the programme should be to maximise the number of South African's and locals employed during the operational phase of the project;
- INCA Energy, in consultation with the MM, should investigate the opportunities for establishing a Community Development Trust / Fund (see above comments).

### **Assessment of No-Go option**

There is no impact, as the current status quo will be maintained. The potential employment and economic benefits associated with the proposed PVSEF would however be forgone. The potential opportunity costs in terms of local capital expenditure, employment, skills development and opportunities for local business are therefore regarded as a negative.

## **4.4.2 Development of infrastructure for the generation of clean, renewable energy**

South Africa currently relies on coal-powered energy to meet more than 90% of its energy needs. Much of the coal used has a high sulphur content. As a result South Africa is the nineteenth largest per capita producer of carbon emissions in the world, and Eskom, as an energy utility, has been identified as the world's second largest producer carbon emissions.

The overall contribution to South Africa's total energy requirements of the proposed PVSEF is relatively small. However, the 30 MW produced will help to offset the total carbon emissions associated with energy generation in South Africa. Given South Africa's reliance on Eskom as a power utility, the benefits associated with an IPP based on renewable energy are regarded as an important contribution.

**Table 4.9: Implementation of clean, renewable energy infrastructure**

<b>Nature:</b> Promotion of clean, renewable energy		
	<b>Without Mitigation</b>	<b>With Mitigation</b> (The provision of renewable energy infrastructure is in itself a mitigation measure)
<b>Extent</b>	Local, Regional and National (4)	Local, Regional and National (4)
<b>Duration</b>	Long term (4)	Long term (4)
<b>Magnitude</b>	Low (4)	Low (4)
<b>Probability</b>	Highly Probable (4)	Highly Probable (4)
<b>Significance</b>	Medium (48)	Medium (48)
<b>Status</b>	Positive	Positive
<b>Reversibility</b>	Yes	
<b>Irreplaceable loss of resources?</b>	Yes, impact of climate change on ecosystems	
<b>Can impact be mitigated?</b>	Yes	
<b>Enhancement:</b> See below		
<b>Cumulative impacts:</b> Reduce carbon emissions via the use of renewable energy and associated benefits in terms of global warming and climate change.		
<b>Residual impacts:</b> See cumulative impacts		

**Assessment of No-Go option**

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

**Recommended mitigation measures**

The establishment of the proposed facility is a mitigation measure in itself. In order to maximise the benefits of the proposed project INCA Energy should:

- Use the project to promote and increase the contribution of renewable energy to the national energy supply;
- Maximise the public’s exposure to the project via an extensive communication and advertising programme;
- Implement a training and skills development programme for locals during the first 5 years of the operational phase. The aim of the programme should be to maximise the number of South African’s employed during the operational phase of the project;
- Investigate the opportunities for establishing a Community Development Trust/Fund. The revenue for the trust should be derived from the income generated from the sale of energy from the plant. The Community Trust should be linked to funding and supporting projects and initiatives identified in the Matzikama IDP.

#### 4.4.3 Influx of job seekers to the area

While the proposed INCA Vredendal PVSEF on its own is unlikely to result in an influx of job seekers during the operational phase, the proposed establishment of a number of solar energy projects in the Matzikama area is likely to attract job seekers to the area. These issues are similar to the concerns associated with the influx of jobs seekers during the construction phase and include:

- Impacts on existing social networks and community structures;
- Competition for housing, specifically low cost housing;
- Pressure on local services, such as schools, clinics etc;
- Competition for scarce jobs;
- Increase in incidences of crime.

**Table 4.10: Assessment of impact of job seekers on local communities**

<b>Nature:</b> Potential impacts on family structures, social networks and community services associated with the influx of job seekers		
	<b>Without Mitigation</b>	<b>With Mitigation</b>
<b>Extent</b>	Local (3)	Local (2)
<b>Duration</b>	Permanent (5) (For job seekers that stay on the town)	Permanent (5) (For job seekers that stay on the town)
<b>Magnitude</b>	Low for the community as a whole (4) High-Very High for specific individuals who may be affected by STD's etc. (10)	Minor for community as a whole (2) High-Very High for specific individuals who may be affected by STD's etc. (10)
<b>Probability</b>	Probable (3)	Probable (3)
<b>Significance</b>	Medium for the community as a whole (24) Medium -High for specific individuals who may be affected by STD's etc. (54)	Low for the community as a whole (27) Medium-High for specific individuals who may be affected by STD's etc. (51)
<b>Status</b>	Negative	Negative
<b>Reversibility</b>	No in case of HIV and AIDS	No in case of HIV and AIDS
<b>Irreplaceable loss of resources?</b>	Yes, if people contract HIV/AIDS. Human capital plays a critical role in communities that rely on farming for their livelihoods	
<b>Can impact be mitigated?</b>	Yes, to some degree. However, the risk cannot be eliminated	
<b>Mitigation:</b> See below		
<b>Cumulative impacts:</b> Impacts on family and community relations that may, in some cases, persist for a long period of time. Also in cases where unplanned / unwanted pregnancies occur or members of the community are infected by an STD, specifically HIV and or AIDS, the impacts may be permanent and have long term to permanent cumulative impacts on the affected individuals and/or their families and the community.		
<b>Residual impacts:</b> See cumulative impacts.		

### Recommended mitigation measures

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

- INCA Energy, in consultation with the MM, should investigate the option of establishing a Local Community Forum to monitor and identify potential problems that may arise due to the influx of job seekers to the area. The Forum should also include the other proponents of solar energy projects in the area;
- Implement a policy that no employment will be available at the gate.

#### 4.4.4 Loss of farm labour

Experience from other projects indicates that the loss of farm workers is an issue of concern. In most instances local farmers are unlikely to be in a position to compete with the salaries offered by the solar energy companies. As a result farm labourers may be tempted to resign from their current positions on farms. The loss of skilled and experienced farm labour would have a negative impact on local farmers.

While the proposed INCA Vredendal PVSEF on its own is unlikely to result in a significant loss of farm labour, the proposed establishment of a number of solar energy projects in the Matzikama area has the potential to impact on the farming sector. However, at the end of the day farm labour can be replaced. The potential impacts on farm operations are therefore likely to be temporary.

The potential impacts for the affected farmers associated with the loss of permanent farm labour are exacerbated by the security of tenure that permanent farm labourers enjoy in terms of the Extension of Security and Tenure Act (ESTA). Those farm labourers which are eligible under ESTA and who take up jobs during the construction phase are entitled stay on in their houses on the farms in question. The net effect is that the farmer may have to incur the costs associated with the construction of new dwellings for new labour appointed to replace the labour lost to the solar energy sector.

However, at the same time the employment opportunities associated with the solar energy sector may offer local farm workers with an opportunity to get better paid jobs which would benefit them and their families. These jobs may also enable them to move off the farms and into local towns, which would improve their access to services such as schools and clinics etc. This would represent a positive social benefit for the farm workers in question.

**Table 4.11: Assessment of loss of farm labour during the operational phase**

<b>Nature:</b> Potential impact on local farmers associated with loss of farm labour to the operational phase		
	<b>Without Mitigation</b>	<b>With Mitigation</b>
<b>Extent</b>	Local and Regional (3)	Local and Regional (3)
<b>Duration</b>	Short term (2) (Assumed that farm labour can be replaced)	Short term (2) (Assumed that farm labour can be replaced)
<b>Magnitude</b>	Low	Low

	(4)	(4)
<b>Probability</b>	Probable (3)	Probable (3)
<b>Significance</b>	Low (27)	Low (27)
<b>Status</b>	Negative	Negative
<b>Reversibility</b>	Yes, if farm workers return or are replaced	Yes, if farm workers return or are replaced
<b>Irreplaceable loss of resources?</b>	No	No
<b>Can impact be mitigated?</b>	Yes, to some degree. However, the risk cannot be eliminated	
<b>Mitigation:</b> See below		
<b>Cumulative impacts:</b> Impacts on farm operations due to loss of experienced farm labour		
<b>Residual impacts:</b> See cumulative impacts.		

#### Recommended mitigation measures

While INCA Energy could liaise with local farmers in the area and undertake not to employ farm worker were possible, it is not possible to prevent farm workers from applying for work in other sectors. There are therefore no recommended mitigation measures. Also it is assumed that farm labour can be replaced. The impacts would therefore be temporary.

#### 4.4.5 Impact on productive agricultural land

This issue relates to the potential long-term impact of the SEF and associated infrastructure on existing farming activities, specifically the loss of land for grazing on Gordonia (the parent farm on which the INCA site is located). This loss may, in turn, impact on the viability of operations and the livelihoods of the affected farmers.

As indicated above, site currently supports no significant productive agricultural uses. The soils on the site are potentially suitable for irrigation. However, the availability of water is a key limiting factor due to the distance from the Olifants River. In addition, development of the site would require pumping infrastructure which would need to cross the R362 and the Koekenaap-Vredendal railway line. The impact on current and future agricultural uses of the land is therefore regarded as low.

**Table 4.12: Potential impacts on farming activities**

<b>Nature:</b> Potential loss of productive agricultural land associated with the PVSEF footprint and associated potential impact on viability of operations		
	<b>Without Mitigation</b>	<b>With Mitigation</b>
<b>Extent</b>	Local (1)	Local (1)
<b>Duration</b>	Long term-permanent if disturbed areas are not effectively rehabilitated (5)	Short term if damaged areas are rehabilitated (1)
<b>Magnitude</b>	Minor (2)	Minor (2)
<b>Probability</b>	Highly Probable (4)	Highly Probable (4)
<b>Significance</b>	Moderate (32)	Low (16)

<b>Status</b>	Negative	Negative
<b>Reversibility</b>	Yes, disturbed areas can be rehabilitated	Yes, disturbed areas can be rehabilitated
<b>Irreplaceable loss of resources?</b>	Yes, loss of farmland. However, disturbed areas can be rehabilitated	Yes, loss of farmland. However, disturbed areas can be rehabilitated
<b>Can impact be mitigated?</b>	Yes, however, loss of farmland cannot be avoided	Yes, however, loss of farmland cannot be avoided
<b>Mitigation:</b> See below		
<b>Cumulative impacts:</b> Overall loss of farmland could affect the livelihoods of the affected farmers, their families, and the workers on the farms and their families. However, disturbed areas can be rehabilitated.		
<b>Residual impacts:</b> See cumulative impacts.		

### Assessment of No-Go option

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

### Recommended mitigation measures

Recommendations for the construction phase should be implemented. In addition, the applicable provisions of the 2011 Amended LUPO Regulations are mandatory, and should be implemented.

#### 4.4.6 Impact on sense of place and rural character of the landscape

The components associated with the proposed facility will have a visual impact and, in so doing, impact on the landscape and rural sense of the place of the area. However, the proposed site is located near the Juno substation and is flanked by two railway lines. The visual integrity of the site has therefore been severely impacted by existing infrastructure on the site. The impact of the proposed PVSEF on the areas sense of place is therefore likely to be low. The site is also well-buffered from the R362 by relative distance and topography. In addition, the R362 Holrivier Road is not regarded as a scenic road.

The key findings of the specialist visual impact assessment (VIA) (MetroGIS, November, 2011) are summarized below.

**Table 4.13: Visual impact and impact on sense of place**

<b>Nature:</b> Visual impact associated with the proposed solar facility and the potential impact on the areas rural sense of place.		
	<b>Without Mitigation</b>	<b>With Mitigation</b>
<b>Extent</b>	Local (4)	Local (4)
<b>Duration</b>	Long term (4)	Long term (4)
<b>Magnitude</b>	Moderate (6)	Moderate (6)
<b>Probability</b>	Highly Probable (4)	Highly Probable (4)
<b>Significance</b>	Medium (56)	Medium (56)
<b>Status</b>	Negative	Negative
<b>Reversibility</b>	Yes, solar facility can be removed.	

<b>Irreplaceable loss of resources?</b>	No	
<b>Can impact be mitigated?</b>	Yes	
<b>Enhancement:</b> See below		
<b>Cumulative impacts:</b> Potential impact on current rural sense of place		
<b>Residual impacts:</b> See cumulative impacts		

### Assessment of No-Go option

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

### Recommended mitigation measures

The recommendations contained in the VIA should be implemented. In addition, the 2011 Amended LUPO Regulations (mandatory) makes provision for various measures to address potential visual impacts, including siting, lay-out, height of ancillary structures, screening and lighting (see: Section 2.4.1.). The provisions are mandatory, and it is therefore assumed that these measures will be implemented.

#### 4.4.7 Potential impacts on tourism

The tourism sector is regarded as a key economic diversification sector in the MM, with the estimated capacity to provide significant benefits to the MM by 2020 (employment, investment etc.). Seasonal wildflower displays and rich botanical endemism constitute the areas key tourism attractions. However, as indicated above, the visual integrity of the site has been severely impacted by existing infrastructure near the site. The impact of the proposed PVSEF on the areas sense of place is therefore likely to be low. In addition, the R362 is not regarded as a scenic route. While the West Coast Wine Route (which includes at least 2 wine farms along the R362 Holrivier Road) is considered to be a valuable secondary asset to MM tourism, it is not seen as a key component of the of the regions comparative advantage. The potential impact of the proposed PVSEF on the areas local and regional tourism potential is therefore regarded as low. In some instances the plant may also attract tourists to the area. However, the significance of this potential benefit is also rated as low positive.

The findings of the VIA indicate that the anticipated visual impact of the facility on existing tourist routes, as well as on the tourism potential of the region, is expected to be **low**.

**Table 4.14: Potential impact on tourism**

<b>Nature:</b> Potential impact of the PVSEF on local tourism		
	<b>Without Mitigation</b>	<b>With Enhancement / Mitigation</b>
<b>Extent</b>	Local (2)	Local (3)
<b>Duration</b>	Long term (4)	Long term (4)
<b>Magnitude</b>	Low (2)	Low (2)
<b>Probability</b>	Probable (3)	Probable (3)
<b>Significance</b>	Low (24) (Applies to both – and +)	Low (27) (Applies to both – and +)

<b>Status</b>	Negative (Potential to distract from the tourist experience of the area) Positive (Potential to attract people to the area)	Negative (Potential to distract from the tourist experience of the area) Positive (Potential to attract people to the area)
<b>Reversibility</b>	Yes	
<b>Irreplaceable loss of resources?</b>	No	
<b>Can impact be enhanced?</b>	Yes	
<b>Enhancement:</b> See below		
<b>Cumulative impacts:</b> The proposed PVSEF is one of two SEFs proposed in the MM area. Due to size and height, of PVSEFs, cumulative impacts are not rated significant.		
<b>Residual impacts:</b> See cumulative impacts		

### Assessment of No-Go option

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

### Recommended mitigation measures

The recommendations contained in the VIA should be implemented. In addition, the 2011 Amended LUPO Regulations (mandatory) makes provision for various measures to address potential visual impacts, including siting, lay-out, height of ancillary structures, screening and lighting (see: Section 2.4.1.). The provisions are mandatory, and it is therefore assumed that these measures will be implemented.

## 4.5 ASSESSMENT POWER LINE OPTIONS

The proposed facility includes the establishment of an overhead power (132kV) feeding into the Eskom electricity network at the existing Juno Substation which is located ~ 1.5 km from the site. As indicated above, the area is impacted by existing power lines associated with the Juno substation. The visual integrity of the site has therefore been impacted by the existing energy related infrastructure located both on and adjacent to the site. The social impacts associated with the power line will therefore be low.

The findings of the VIA indicate that the visual impact associated with the new power line is rated to be of **moderate** significance after mitigation.

**Table 4.15: Assessment of transmission line options**

<b>Nature:</b> Potential visual impact and impact on sense of place associated with power lines		
	<b>Without Mitigation</b>	<b>With Mitigation</b>
<b>Extent</b>	Local (2)	Local (1)
<b>Duration</b>	Long term (4)	Long term (4)
<b>Magnitude</b>	Minor (2)	Minor (2)
<b>Probability</b>	Probable (3)	Probable (3)

<b>Significance</b>	Low (24)	Low (21)
<b>Status</b>	Negative	Negative
<b>Reversibility</b>	Yes	
<b>Irreplaceable loss of resources?</b>	No	
<b>Can impact be mitigated?</b>	Yes	
<b>Enhancement:</b> See below		
<b>Cumulative impacts:</b> Limited visual and impact on sense of place		
<b>Residual impacts:</b> See cumulative impacts		

### Assessment of No-Go option

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

### Recommended mitigation measures

The recommendations contained in the VIA should be implemented. The measures listed above to address the potential impacts associated with the construction phase also apply to the construction of the power line.

## 4.6 POTENTIAL HEALTH IMPACTS

The primary environmental, health, and safety issues associated with solar energy involve how they are manufactured, installed, and ultimately disposed of. In particular, the manufacturing of photovoltaic cells often requires hazardous materials such as arsenic and cadmium. Even relatively inert silicon, a major material used in solar cells, can be hazardous to workers if it is breathed in as dust. Workers involved in manufacturing photovoltaic modules and components must consequently be protected from exposure to these materials. However, none of these potential hazards is much different in quality or magnitude from the innumerable hazards people face routinely in an industrial society. Through effective regulation, the dangers can very likely be kept at a very low level. In addition, the relevant risks essentially concern workers at the cell manufacturing plant (in this case likely overseas), and therefore this issue falls outside the scope of the EIA.

## 4.7 ASSESSMENT OF DECOMMISSIONING PHASE

Typically, the major social impacts associated with the decommissioning phase are linked to the loss of jobs and associated income. This has implications for the households who are directly affected, the communities within which they live, and the relevant local authorities. However, in the case of the proposed facility the decommissioning phase is likely to involve the disassembly and replacement of the existing components with more modern technology. This is likely to take place in the 25 - 30 years post commissioning. The decommissioning phase is therefore likely to create additional, construction type jobs, as opposed to the jobs losses typically associated with decommissioning.

Given the relatively small number of people employed during the operational phase (~ 50), the decommissioning of the facility will have a limited negative social impact

on the local community. In addition, the potential impacts associated with the decommissioning phase can also be effectively managed with the implementation of a retrenchment and downscaling programme. With mitigation, the impacts are assessed to be Low (negative).

### **Recommended mitigation measures**

The following mitigation measures are recommended:

- INCA Energy should investigate the option of relocating employees to other solar facilities when the plant is decommissioned;
- INCA Energy should ensure that retrenchment packages are provided for all staff who stand to lose their jobs when the plant is decommissioned;
- All structures and infrastructure associated with the proposed facility should be dismantled and transported off-site on decommissioning;
- INCA Energy should investigate the option of establishing an Environmental Rehabilitation Trust Fund to cover the costs of decommissioning and rehabilitation of disturbed areas. The Trust Fund should be funded by a percentage of the revenue generated from the sale of energy to the national grid over the 30 year operational life of the facility. The rationale for the establishment of a Rehabilitation Trust Fund is linked to the experiences with the mining sector in South Africa and failure of many mining companies to allocate sufficient funds during the operational phase to cover the costs of rehabilitation and closure. In this regard applicable provisions of the 2011 Amended LUPO Regulations linked to provision for decommissioning/ rehabilitation are mandatory, and should be implemented.

## **4.8 ASSESSMENT OF CUMULATIVE IMPACTS**

Although there appear to be no guidelines for solar facilities, the Australian Wind Farm Development Guidelines (Draft, July 2010) indicate that the cumulative impact of multiple wind farm facilities is likely to become an increasingly important issue for wind farm developments in Australia. This finding is also likely to apply to PVSEFs and is also likely to be the case in South Africa. The key concerns in terms of cumulative impacts are, as in the case of wind farms, also likely to be linked to visual impacts and the impact on rural, undeveloped landscapes.

The Scottish Natural Heritage (2005) describes a range of potential cumulative landscape impacts associated with wind farms on landscapes. These issues raised in these guidelines as to what defines a cumulative impact are also regarded as pertinent to solar facilities, specifically given that the key issue of concern is likely to relate to the impact on rural, undeveloped landscapes. The relevant issues raised in the by Scottish Natural Heritage include:

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

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

Research on wind farms undertaken by Warren and Birnie (2009) also highlights the visual and cumulative impacts on landscape character. The paper notes that given that aesthetic perceptions are a key determinant of people's attitudes, and that these perceptions are subjective, deeply felt and diametrically contrasting, it is not hard to understand why the arguments become so heated. Because landscapes are often an important part of people's sense of place, identity and heritage, perceived threats to familiar vistas have been fiercely resisted for centuries. The paper also identifies two factors that important in shaping people's perceptions of wind farms' landscape impacts. The first of these is the cumulative impact of increasing numbers of wind farms (Campbell, 2008). The research found that if people regard a region as having 'enough' wind farms already, then they may oppose new proposals. The second factor is the cultural context. This relates to people's perception and relationship with the landscape. In the South African context, the majority of South Africans have a strong connection with and affinity for the large, undisturbed open spaces that are characteristic of the South African landscape. The concerns raised with regard to wind farms and the impact on landscapes are also likely to apply to solar facilities.

The impact of solar facilities on the landscape is therefore likely to be a key issue in South Africa, specifically given South African's strong attachment to the land and the growing number of solar plant applications. With regard to the area, a number of PVSEFs have been proposed for the Matzikama area. The Western Cape Environmental Authorities should therefore be aware of the potential cumulative impacts when evaluating applications. However, as indicated above, the proposed site is located in close proximity to the Juno substation and the area's sense of place has been impacted by the substation and its associated power lines. The visual integrity of the site has therefore been impacted by the existing energy related infrastructure in the area.

**Table 4.16: Cumulative impacts on sense of place and the landscape**

<b>Nature:</b> Visual impacts associated with the establishment of more than one PVSEF and the potential impact on the areas rural sense of place and character of the landscape.		
	<b>Without Mitigation</b>	<b>With Mitigation</b>
<b>Extent</b>	Local and regional (2)	Local and regional (2)
<b>Duration</b>	Long term (4)	Long term (4)
<b>Magnitude</b>	Minor (2)	Minor (2)
<b>Probability</b>	Probable (3)	Probable (3)
<b>Significance</b>	Low (24)	Low (24)
<b>Status</b>	Negative	Negative
<b>Reversibility</b>	Yes. Solar energy plant components and other infrastructure can be removed.	
<b>Irreplaceable loss of resources?</b>	No	
<b>Can impact be mitigated?</b>	Yes	
<b>Enhancement:</b> See below		
<b>Cumulative impacts:</b> Impact on other activities whose existence is linked to linked to rural sense of place and character of the area, such as tourism, bird watching, and hunting.		
<b>Residual impacts:</b> See cumulative impacts		

### Assessment of No-Go option

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

### Recommended mitigation measures

The establishment of a number of large solar facilities in the area does have the potential to have a negative cumulative impact on the areas sense of place and the landscape. The environmental authorities should consider the overall cumulative impact on the rural character and the areas sense of place before a final decision is taken with regard to the optimal number of such plants in an area. The applicable provisions of the 2011 Amended LUPO Regulations are mandatory, and should also be implemented.

In addition to the potential negative impacts, the proposed INCA Vredendal PVSEF also has the potential to result in significant positive cumulative impacts, specifically the establishment of a number of renewable energy facilities in Matzikama area will create a number of socio-economic opportunities for MM, which, in turn, will result in a positive social benefit. The positive cumulative impacts include creation of employment, skills development and training opportunities, creation of downstream business opportunities and stimulation of the local property market.

**Table 4.17: Cumulative impacts on local economy**

<b>Nature:</b> The establishment of a number of solar energy facilities in and around Vredendal will create employment, skills development and training opportunities, creation of downstream business opportunities and stimulation of the local property market.		
	<b>Without Mitigation</b>	<b>With Mitigation</b>
<b>Extent</b>	Local and regional (3)	Local and regional (4)
<b>Duration</b>	Long term (4)	Long term (4)
<b>Magnitude</b>	Low (4)	Moderate (6)
<b>Probability</b>	Highly Probable (4)	Definite (5)
<b>Significance</b>	Medium (44)	High (70)
<b>Status</b>	Positive	Positive
<b>Reversibility</b>	Yes. Solar energy plant components and other infrastructure can be removed.	
<b>Irreplaceable loss of resources?</b>	No	
<b>Can impact be mitigated?</b>	Yes	
<b>Enhancement:</b> See below		
<b>Cumulative impacts:</b> Positive impact on the local and regional economy through the creation of downstream opportunities and wage spend in the local economy		
<b>Residual impacts:</b> See cumulative impacts		

#### **Assessment of No-Go option**

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

#### **Recommended mitigation measures**

The proposed establishment of proposed PVSEF should be supported.

#### **4.9 ASSESSMENT OF NO-DEVELOPMENT OPTION**

As indicated above, South Africa currently relies on coal-powered energy to meet more than 90% of its energy needs. As a result South Africa is one of the highest per capita producers of carbon emissions in the world and Eskom, as an energy utility, has been identified as the world's second largest producer carbon emissions (Cape Times, 15 November 2007). The No-Development option would represent a lost opportunity for South Africa to supplement its current energy needs with clean, renewable energy. Given South Africa's position as one of the highest per capita producer of carbon emissions in the world, this would represent a High negative social cost.

However, at a provincial and national level, it should be noted that the INCA PVSEF development proposal is not unique. In that regard, a significant number of WEF developments are currently proposed in the Western and Eastern Cape Provinces.

Foregoing the proposed INCA Vredendal PVSEF development would therefore not necessarily compromise the development of renewable energy facilities in the Western Cape or South Africa.

**Table 4.18: Assessment of no-development option**

<b>Nature:</b> The no-development option would result in the lost opportunity for South Africa to supplement its current energy needs with clean, renewable energy		
	<b>Without Mitigation</b>	<b>With Mitigation<sup>12</sup></b>
<b>Extent</b>	Local-International (5)	Local-International (5)
<b>Duration</b>	Long term (4)	Long term (4)
<b>Magnitude</b>	Moderate (6)	Moderate (6)
<b>Probability</b>	Highly Probable (4)	Highly Probable (4)
<b>Significance</b>	High (60)	High (60)
<b>Status</b>	Negative	Positive
<b>Reversibility</b>	Yes	
<b>Irreplaceable loss of resources?</b>	Yes, impact of climate change on ecosystems	
<b>Can impact be mitigated?</b>	Yes	
<b>Enhancement:</b> See below		
<b>Cumulative impacts:</b> Reduce carbon emissions via the use of renewable energy and associated benefits in terms of global warming and climate change.		
<b>Residual impacts:</b> See cumulative impacts		

**Recommended enhancement measures**

The proposed facility should be developed and the mitigation and enhancement measures identified in the SIA and other specialist studies should be implemented. However, the impact of large solar facilities on the sense of place and landscape are issues need to be addressed in the location, design and layout of the proposed plant.

<sup>12</sup> Assumes establishment of some form of Community Trust / Development Fund as discussed above.

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## **SECTION 5: KEY FINDINGS AND RECOMMENDATIONS**

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### **5.1 INTRODUCTION**

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

- A review of the issues identified during the Scoping Process;
- A review of key planning and policy documents pertaining to the area;
- Semi-structured interviews with interested and affected parties;
- A review of social and economic issues associated with similar developments;
- A review of selected specialist studies undertaken as part of the EIA;
- A review of relevant literature on social and economic impacts;
- The experience of the authors with other solar energy projects in South Africa

### **5.2 SUMMARY OF KEY FINDINGS**

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

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

The section also comments on the potential health impacts associated with solar facilities.

#### **5.2.1 Policy and planning issues**

- The National Energy Act (2008);
- The White Paper on the Energy Policy of the Republic of South Africa (December 1998);
- The White Paper on Renewable Energy (November 2003);
- Integrated Resource Plan (IRP) for South Africa (2010-2030);
- White Paper on Sustainable Energy for the Western Cape (Final Draft, 2008);
- The Western Cape Draft Strategic Plan (2010);
- Climate Change Strategy and Action Plan for the Western Cape (2008).
- Western Cape Provincial Spatial Development Framework (2009);
- Western Cape Amended Zoning Scheme Regulations for the establishment of Commercial Renewable Energy Facilities (2011);
- Matzikama Integrated Development Plan (2007-2011);
- Matzikama Tourism Development Strategy (2010-2015).
- Matzikama Spatial Development Framework (2010).

The findings of the review indicated that solar energy was strongly supported at a national and local level. At a national level the White Paper on Energy Policy (1998) notes:

- Renewable resources generally operate from an unlimited resource base and, as such, can increasingly contribute towards a long-term sustainable energy future;
- The support for renewable energy policy is guided by a rationale that South Africa has a very attractive range of renewable resources, particularly **solar** and wind and that renewable applications are in fact the least cost energy service in many cases; more so when social and environmental costs are taken into account.

The IRP 2010 also allocates 43% of energy generation in South Africa to renewables. At a provincial level wind and solar are identified as suitable renewable energy options for the Western Cape. In this regard the 2009 Spatial Development Plan notes that 25% of the Province's energy generation should consist of renewables by 2020. It should also be noted that meeting the requirements outlined in the 2011 LUPO Regulations for REF's is mandatory (e.g. decommissioning/ rehabilitation fund; mitigation of disturbances, etc).

At a local level, the renewable energy sector is not explicitly identified as a sector or initiative in the current MM policy and planning documents. However, the MM LED Manager indicated that the MM recognizes the potential benefits associated with the development of PVSEFs in the MM. These benefits include long term employment and training opportunities as well as potential benefits associated with contributions to an envisaged multi-stakeholder MM community development fund (Philips – pers. comm).

The findings of the review of the relevant policies and documents pertaining to the energy sector therefore indicate that solar energy and the establishment of solar energy plants are supported at a national, provincial, and local level. It is therefore the opinion of the authors that the establishment of a PVSEF on the proposed site is supported by national, provincial and local policies and planning documents. However, the provincial and local policy and planning documents also make reference to the importance of tourism and the regions natural resources. Care therefore needs to be taken to ensure that the development of large renewable energy projects, such as the proposed solar energy facility do not impact on the region's natural resources and the tourism potential of the Province.

#### **5.1.1 Construction phase impacts**

The key social issues associated with the construction phase include:

##### **Potential positive impacts**

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

The construction phase is expected to extend over a period of 10-12 months and create approximately ~ 100 employment opportunities. It is anticipated that approximately 55 % (55) of the employment opportunities will be available to low skilled workers (construction labourers, security staff etc), 30% (30) to semi-skilled workers (drivers, equipment operators etc) and 15% (15) for skilled personnel (engineers, land surveyors, project managers etc). The majority of the employment opportunities, specifically the low and semi-skilled opportunities, are likely to be available to local residents in the area, specifically residents from the towns of

Lutzville and Vredendal. The majority of the beneficiaries are likely to be historically disadvantaged (HD) members of the community. This would represent a significant positive social benefit in an area with limited employment opportunities. However, the low education and skills levels in the area will hamper potential opportunities for local communities.

The capital expenditure associated with the construction phase will be in the region of R 750 million (2011 rand value). The total wage bill for the 10-12 month construction phase will be in the region of R 10 million (2011 rand value). A percentage of the wage bill will be spent in the local economy which will create opportunities for local businesses in Lutzville and Vredendal. The sector of the local economy that is most likely to benefit from the proposed development is the local service industry. The potential opportunities for the local service sector would be linked to accommodation, catering, cleaning, transport and security, etc. associated with the construction workers on the site. The benefits to the local economy will however be confined to the construction period (10-12 months).

The contractors appointed during the construction phase are also likely to provide on-site training and skills development opportunities. However, the majority of benefits are likely to accrue to personnel employed by the relevant contractors. In the absence of specific commitments from the developer to employ local contractors the potential for meaningful skills development and training for members from the local communities may be limited.

#### **Potential negative impacts**

- Impacts associated with the presence of construction workers on site
- Influx of job seekers to the area;
- Loss of farm labour to the construction phase;
- Increased risk of stock theft, poaching and damage to farm infrastructure associated with presence of construction workers on the site;
- Impact of heavy vehicles, including damage to roads, safety, noise and dust
- Potential loss of grazing land associated with construction-related activities.

The significance of the potential negative impacts with mitigation was assessed to be of Low significance. The majority of the potential negative impacts can therefore be effectively mitigated if the recommended mitigation measures are implemented. In addition, given that the majority of the low and semi-skilled construction workers can be sourced from the local area the potential risk to local family structures and social networks is regarded as low. However, the impact on individuals who are directly impacted on by construction workers and or job seekers (i.e. contract HIV/ AIDS) was assessed to be of Medium-High negative significance.

Table 5.1 summarises the significance of the impacts associated with the construction phase.

**Table 5.1: Summary of social impacts during construction phase**

<b>Impact</b>	<b>Significance No Mitigation</b>	<b>Significance With Mitigation</b>
<b>Creation of employment and business opportunities</b>	Medium (Positive impact)	Medium (Positive impact)
<b>Presence of construction workers and potential impacts on family structures and social networks</b>	Low (Negative impact for community as a whole) Medium-High (Negative impact of individuals)	Low (Negative impact for community as a whole) Medium-High (Negative impact of individuals)
<b>Influx of job seekers</b>	Low (Negative impact for community as a whole) Medium-High (Negative impact of individuals)	Low (Negative impact for community as a whole) Medium-High (Negative impact of individuals)
<b>Loss of farm labour</b>	Low (Negative impact)	Low (Negative impact)
<b>Risk of stock theft, poaching and damage to farm infrastructure</b>	Low (Negative impact)	Low (Negative impact)
<b>Impact of heavy vehicles and construction activities</b>	Low (Negative impact)	Low (Negative impact)
<b>Loss of farmland</b>	Medium (Negative impact)	Low (Negative impact)

### 5.2.2 Operational phase

The key social issues affecting the operational phase include:

#### Potential positive impacts

- Creation of employment and business opportunities. The operational phase will also create opportunities for skills development and training;
- The establishment of infrastructure to generate renewable energy.

The total number of permanent employment opportunities is estimated to be in the region of 50. Of this total ~ 40 are low skilled workers, 8 semi-skilled and 2 skilled. The annual wage bill for the operational phase will be ~ R4.2 million (2011 rand value). The majority of the beneficiaries are therefore likely to be historically disadvantaged (HD) members of the community. Given the location of the proposed facility the majority of permanent staff is likely to reside in Lutzville and or Vredendal.

In terms of accommodation options, a percentage of the non-local permanent employees may purchase a house in one of these two towns, while others may decide to rent. Both options would represent a positive economic benefit for the region. In addition, a percentage of the monthly wage bill earned by permanent staff would be spent in the local economy. The benefits to the local economy will extend over the 25-30 year operational lifespan of the project.

The establishment of a number of renewable energy facilities, including PVSEFs, in the Matzikama region will also create significant economic opportunities for the area. The significance of this impact is rated as High Positive. The proposed development also represents an investment in infrastructure for the generation of clean, renewable energy, which, given the challenges created by climate change, represents a Positive High social benefit for society as a whole.

Due the large number of renewable energy facilities proposed in the Matzikama Municipal area it is recommended that the MM investigate the Community Development Trust / Fund model developed by the Theeswaterskloof LM in the Western Cape. In this regard the the Theeswaterskloof LM has made it a requirement for all potential renewable energy operators to contribute to a Community Development Trust / Fund. In terms of the structure of the Trust, a percentage of the revenue from the renewable energy operations is allocated to projects identified in the Theeswaterskloof IDP. Of this total, 50% of the revenue is allocated to infrastructure projects and the remaining 50% to social projects and initiatives, such as skills development and training. The Matzikama IDP/LED manager indicated that the option of establishing such a fund was being investigated.

#### **Potential negative impacts**

- Influx of job seekers to the area;
- Loss of farm workers to jobs associated with the operational phase;
- Loss of productive agricultural land;
- The visual impacts and associated impact on sense of place;
- Potential impact on tourism.

The significance of the potential negative impacts with mitigation was assessed to be of Low significance. The majority of the potential negative impacts can therefore be effectively mitigated if the recommended mitigation measures are implemented. However, the impact on individuals who are directly impacted on by job seekers (i.e. contract HIV/ AIDS) was assessed to be of Medium-High negative significance.

The visual impacts on landscape character associated with large renewable energy facilities, such as PVSEFs, are highlighted in the research undertaken by Warren and Birnie (2009). In the South African context, the majority of South Africans have a strong connection with and affinity for the large, undisturbed open spaces that are characteristic of the South African landscape. The impact of large, solar energy plants on the landscape is therefore likely to be a key issue in South Africa, specifically given South African's strong attachment to the land and the growing number of solar energy applications. However, in the case of the proposed INCA Vredendal PVSEF, the visual integrity of the site has been impacted by the existing power related infrastructure associated with the Juno substation, which is located in close proximity to the site.

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

**Table 5.2: Summary of social impacts during operational phase**

<b>Impact</b>	<b>Significance No Mitigation</b>	<b>Significance With Mitigation</b>
<b>Creation of employment and business opportunities</b>	Medium (Positive impact)	High (Positive impact)
<b>Promotion of renewable energy projects</b>	Medium (Positive impact)	Medium (Positive impact)
<b>Influx of job seekers</b>	Low (Negative impact for community as a whole) Medium-High (Negative impact of individuals)	Low (Negative impact for community as a whole) Medium-High (Negative impact of individuals)
<b>Loss of farm labour</b>	Low (Negative)	Low (Negative)
<b>Impact on agricultural land</b>	Medium (Negative impact)	Low (Negative impact)
<b>Visual impact and impact on sense of place</b>	Medium (Negative impact)	Medium (Negative impact)
<b>Impact on tourism</b>	Low (Positive and Negative)	Low (Positive and Negative)

### 5.2.3 Assessment of cumulative impacts

The cumulative impacts associated with solar energy facilities, such as the proposed INCA Vredendal PVSEF, are largely linked to the impact on sense of place and visual impacts. In the case of the proposed INCA Vredendal PVSEF the significance of the potential cumulative social impacts, specifically the impact on the landscape, was rated to be low. This due to the impact of the existing power related infrastructure associated with the Juno substation.

However, it is recommended that the environmental authorities consider the overall cumulative impact on the rural character and the areas sense of place before a final decision is taken with regard to the optimal number of PVSEFs in the area. In addition, the siting and number of individual components of the plant should be informed by findings of the relevant VIAs, specifically with respect to the visual impact on farmsteads and important roads in the area.

In addition to the potential negative impacts, the proposed INCA Vredendal PVSEF also has the potential to result in significant positive cumulative impacts, specifically the establishment of a number of renewable energy facilities in Matzikama area will create a number of socio-economic opportunities for MM, which, in turn, will result in a positive social benefit. The positive cumulative impacts include creation of employment, skills development and training opportunities, creation of downstream business opportunities and stimulation of the local property market.

### 5.2.4 Transmission line options

The findings of the SIA indicate that the impacts associated with the proposed overhead power line to the Juno substation will be low.

### **5.2.5 Potential health impacts**

The primary environmental, health, and safety issues associated with solar energy involve how they are manufactured, installed, and ultimately disposed of. In particular, the manufacturing of photovoltaic cells often requires hazardous materials such as arsenic and cadmium. Even relatively inert silicon, a major material used in solar cells, can be hazardous to workers if it is breathed in as dust. Workers involved in manufacturing photovoltaic modules and components must consequently be protected from exposure to these materials. However, none of these potential hazards is much different in nature and or magnitude from the innumerable hazards people face routinely in an industrial society. Through effective regulation, the dangers can very likely be kept at a very low level. In addition, the relevant risks essentially concern workers at the cell manufacturing plant and therefore fall outside the scope of the EIA.

### **5.2.6 Assessment of no-development option**

The No-Development option would represent a lost opportunity for South Africa to supplement its current energy needs with clean, renewable energy. Given South Africa's position as one of the highest per capita producer of carbon emissions in the world, this would represent a High negative social cost. The no-development option also represents a lost opportunity in terms of the employment and business opportunities (construction and operational phase) associated with the proposed PVSEF. This also represents a negative social cost.

However, at a provincial and national level, it should be noted that the INCA PVSEF development proposal is not unique. In that regard, a significant number of WEF developments are currently proposed in the Western and Eastern Cape Provinces. Foregoing the proposed INCA Vredendal PVSEF development would therefore not necessarily compromise the development of renewable energy facilities in the Western Cape or South Africa.

### **5.2.7 Decommissioning phase**

Typically, the major social impacts associated with the decommissioning phase are linked to the loss of jobs and associated income. This has implications for the households who are directly affected, the communities within which they live, and the relevant local authorities. However, in the case of the PVSEFs decommissioning phase is likely to involve the disassembly and replacement of the existing components with more modern technology. This is likely to take place in the 25-30 years post commissioning. The decommissioning phase is therefore likely to create additional, construction type jobs, as opposed to the jobs losses typically associated with decommissioning.

Given the relatively small number of people employed during the operational phase (~ 50), the decommissioning of the facility will have a limited negative social impact on the local community. In addition, the potential impacts associated with the decommissioning phase can also be effectively managed with the implementation of a retrenchment and downscaling programme. With mitigation, the impacts are assessed to be Low (negative).

INCA Energy should also investigate the option of establishing an Environmental Rehabilitation Trust Fund to cover the costs of decommissioning and rehabilitation of disturbed areas. The Trust Fund should be funded by a percentage of the revenue generated from the sale of energy to the national grid over the 25-30 year

operational life of the facility. The rationale for the establishment of a Rehabilitation Trust Fund is linked to the experiences with the mining sector in South Africa and failure of many mining companies to allocate sufficient funds during the operational phase to cover the costs of rehabilitation and closure. The 2011 LUPO Regulations also require that decommissioning activities should include the removal of all REF structures, as well as transmission lines; the disposal of solid and hazardous waste according to applicable waste disposal regulations; and the stabilization and re-vegetation of the site. The LUPO provisions are mandatory. It is assumed that INCA will implement the relevant measures.

### **5.3 CONCLUSIONS AND RECOMMENDATIONS**

The findings of the SIA indicate that the development of the proposed INCA Vredendal PVSEF will create employment and business opportunities for locals during both the construction and operational phase of the project. The mitigation measures listed in the report should be implemented in order to enhance them. In addition, the proposed establishment of a number of renewable energy facilities in the Matzikama region will create socio-economic opportunities, which, in turn, will result in a positive social benefit. The significance of this impact is rated as High Positive.

INCA Energy, in consultation with the Matzikama Municipality, should also investigate the opportunities for establishing a Community Development Trust / Fund that is linked to other proposed renewable energy projects in the area. The revenue for the trust / fund would be derived from the income generated from the sale of energy from the plant. The Community Trust / Fund should be linked to funding and supporting projects and initiatives identified in the Matzikama IDP. The mitigation measures listed in the report to address the potential negative impacts during the construction phase should also be implemented.

The proposed development also represents an investment in clean, renewable energy infrastructure, which, given the challenges created by climate change, represents a positive social benefit for society as a whole. The establishment of the proposed INCA Vredendal PVSEF is therefore supported by the findings of the SIA.

However, the potential impacts associated with large, solar energy facilities on an areas sense of place and landscape cannot be ignored. These impacts are an issue that will need to be addressed by the relevant environmental authorities, specifically given the large number of applications for solar facilities in the area.

### **5.4 IMPACT STATEMENT**

The findings of the SIA undertaken for the proposed INCA Vredendal PVSEF indicate that the development will create employment and business opportunities for locals during both the construction and operational phase of the project. In addition, the visual integrity of the site has been impacted by the existing power related infrastructure associated with the Juno substation. It is therefore recommended that the facility as proposed be supported, subject to the implementation of the recommended mitigation measures and management actions contained in the report.

## **ANNEXURE A: LIST OF SOURCES**

### **Interviews**

- Bam, Mr. Frans (27-10-11). Matzikama Local Municipality: Ward 1 Councilor.
- De Waal, Mr. Herman (26-10-11). Liebendal Farm (owner); Vredendal Agricultural Association.
- Kriek, Ms. Bernette (27-10-11). Matzikama Local Municipality: Spatial planning (WEF and SEF applications).
- Mqingqi, Cllr. Elias (27-10-11). Matzikama Local Municipality: Ward 3 Councilor.
- Phillips, Mr. Lionel (27-10-11). Matzikama Local Municipality: Director: Matzikama IDP and LED.
- Smit, Mr. Riaan (27-10-11). Matzikama Local Municipality: Head: Spatial planning.
- Van der Westhuizen, Ms. Annelie (27-10-11). Matzikama Local Municipality: Spatial planning/ corporate services.
- Van Zyl, Ms. Thesmé (27-10-11). Matzikama Tourism Association: Manager.
- Zandberg, Ms. Laetitia (27-10-11). Gordonia Farm, including Zeekoeigat 277 Rem (Jan Frederick Zandberg Testamentêre Trust).

### **Documents**

- Barbour and van der Merwe (2011a). *Social Impact Assessment for Environmental Impact Assessment (Final Report) – Touwsrivier Solar Energy Facility*. Prepared for the Environmental Evaluation Unit, UCT.
- Barbour and van der Merwe (2011b). *Social Impact Assessment for Environmental Impact Assessment (Draft Report) – Proposed St Helena Wind Energy Facility, Western Cape Province*. Prepared for Arcus Gibb.
- Barbour and van der Merwe (2007). *Social Impact Assessment for Environmental Impact Assessment (Final Report) – Eskom Wind Energy Facility and Associated Infrastructure (Skaapvlei)*. Prepared for Savannah Environmental (Pty) Ltd.
- Matzikama Municipality (2010). Integrated Development Plan 2010/2011 Revision.
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- Provincial Government Western Cape: Department of Environmental Affairs and Development Planning (2009). *Western Cape Provincial Spatial Development Framework*.
- Provincial Government Western Cape: Department of Environmental Affairs and Development Planning (2008). *Climate Change Strategy and Action Plan (Final Draft)*;
- Provincial Government Western Cape: Department of Environmental Affairs and Development Planning (2008). *White Paper on Sustainable Energy for the Western Cape – Final Draft*.

- Provincial Government Western Cape: Department of Environmental Affairs and Development Planning (2007). Sustainable Energy Strategy and Programme of Action for the Western Cape.
- Provincial Government Western Cape: Department of Environmental Affairs and Development Planning (2006). *Strategic Initiative to Introduce Commercial Land Based Wind Energy Development to the Western Cape. Towards a Regional Methodology for Wind Energy Site Selection.*
- PGWC: Department of the Premier (2010). *Delivering the Open Opportunity Society for All. Western Cape Draft Strategic Plan.*
- Provincial Government Western Cape: Provincial Treasury (2006). *Socio-economic profile: West Coast District Municipality.*
- Republic of South Africa: Department of Energy (2011). *Draft Integrated Electricity Resource Plan for South Africa – 2010 to 2030: IRP 2010.*
- Republic of South Africa (2008). *National Energy Act, Act nr. 34 of 2008.*
- Republic of South Africa (2003). *White Paper on Renewable Energy.*
- TerraSoil (2011). *Soil, Land use, Land Capability and Agricultural Potential Survey: Proposed Inca Vredendal Photovoltaic Solar Energy Facility: Vredendal, Western Cape Province.*
- West Coast District Municipality (2010). *West Coast District Municipality Integrated Development Plan 2010-2014.*

#### **Internet**

- [www.capegaetway.gov.za](http://www.capegaetway.gov.za) (Municipal profile information).
- [www.demarcation.org.za](http://www.demarcation.org.za) (Census 2001 data).
- Google Earth 2010.

## ANNEXURE B: ASSESSMENT METHODOLOGY

### METHODOLOGY FOR THE ASSESSMENT OF POTENTIAL IMPACTS

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

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

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

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

S = Significance weighting

E = Extent  
D = Duration  
M = Magnitude  
P = Probability

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

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

## ANNEXURE C: ENVIRONMENTAL MANAGEMENT PLAN

### CONSTRUCTION PHASE

#### Creation of employment and business opportunities

##### OBJECTIVE:

**Maximise local employment and business opportunities associated with the construction phase.**

<b>Project component/s</b>	Construction and establishment activities associated with the establishment of the wind energy facility, including infrastructure etc.	
<b>Potential Impact</b>	The opportunities and benefits associated with the creation of local employment and business should be maximised.	
<b>Activity/risk source</b>	The employment of outside contractors to undertake the work and who make use of their own labour will reduce the employment and business opportunities for locals. Employment of local labour will maximise local employment opportunities.	
<b>Mitigation: Target/Objective</b>	INCA, in consultation with the Matzikama Local Municipality (TWK LM), should aim to employ a minimum of 80% of the low-skilled workers from the local area. This should also be made a requirement for all contractors. INCA should also develop a database of local BEE service providers	
<b>Mitigation: Action/control</b>	<b>Responsibility</b>	<b>Timeframe</b>
<ul style="list-style-type: none"> <li>• Ensure that a minimum of 80% of the low-skilled workers are sourced from the local area.</li> <li>• Where required, implement appropriate training and skills development programmes prior to the initiation of the construction phase to ensure that 80% target is met.</li> <li>• Skills audit to be undertaken to determine training and skills development requirements.</li> <li>• Develop a database of local BEE service providers and ensure that they are informed of tenders and job opportunities;</li> <li>• Identify potential opportunities for local businesses.</li> </ul>	<ul style="list-style-type: none"> <li>• INCA and contractors</li> <li>• INCA</li> <li>• INCA</li> <li>• INCA</li> <li>• INCA</li> </ul>	<ul style="list-style-type: none"> <li>• Employment and business policy document that sets out local employment targets to be in place before construction phase commences.</li> <li>• Where required, training and skills development programmes to be initiated prior to the initiation of the construction phase.</li> <li>• Skills audit to determine need for training and skills development programme undertaken within 1 month of commencement of construction phase commences.</li> <li>• Database of potential local BEE services providers to be completed before construction phase</li> </ul>

		commences.
<b>Performance Indicator</b>	<ul style="list-style-type: none"> <li>• Employment and business policy document that sets out local employment and targets completed before construction phase commences;</li> <li>• 80 % of semi and unskilled labour locally sourced.</li> <li>• Database of potential local BEE services providers in place before construction phase commences.</li> <li>• Skills audit to determine need for training and skills development programme undertaken within 1 month of commencement of construction phase.</li> </ul>	
<b>Monitoring</b>	<ul style="list-style-type: none"> <li>• INCA and or appointed ECO must monitor indicators listed above to ensure that they have been met for the construction phase.</li> </ul>	

## Impact associated with presence of construction workers

### OBJECTIVE:

**Avoid the potential impacts on family structures and social networks associated with presence of construction workers from outside the area**

<b>Project component/s</b>	Construction and establishment activities associated with the establishment of the wind energy facility, including infrastructure etc.	
<b>Potential Impact</b>	The presence of construction workers who live outside the area and who are housed in local towns can impact on family structures and social networks.	
<b>Activity/risk source</b>	The presence of construction workers can impact negatively on family structures and social networks, especially in small, rural communities.	
<b>Mitigation: Target/Objective</b>	To avoid and or minimise the potential impact of construction workers on the local community. This can be achieved by maximising the number of locals employed during the construction phase and minimising the number of workers housed on the site.	
<b>Mitigation: Action/control</b>	<b>Responsibility</b>	<b>Timeframe</b>
<ul style="list-style-type: none"> <li>• Ensure that a minimum of 80% of the low-skilled workers are sourced from the local area. This should be included in the tender documents. Construction workers should be recruited from the local area in and around the towns of Caledon and Botrivier.</li> <li>• Construction workers should be able to provide proof of having lived in the area for five years or longer.</li> <li>• Identify local contractors</li> </ul>	<ul style="list-style-type: none"> <li>• INCA and contractors</li> <li>• INCA</li> </ul>	<ul style="list-style-type: none"> <li>• Identify suitable local contractors prior to the tender process for the construction phase.</li> <li>• Tender documents for contractors include conditions set out in SIA, including transport of workers home over weekends, transportation of workers home on completion of construction phase, establishment of MF etc,</li> <li>• MF established before construction phase</li> </ul>

<p>who are qualified to undertake the required work;</p> <ul style="list-style-type: none"> <li>• Establish a Monitoring Forum (MF) consisting of representatives from the local community, local police, local farming community and the contractor prior to the commencement of the construction phase;</li> <li>• Develop a Code of Conduct to cover the activities of the construction workers housed on the site;</li> <li>• Ensure that construction workers housed attend a brief session before they commence activities. The aim of the briefing session is to inform them of the rules and regulations governing activities on the site as set out in the Code of Conduct.</li> <li>• Ensure that all workers are informed at the outset of the construction phase of the conditions contained on the Code of Conduct;</li> <li>• Ensure that construction workers who are found guilty of breaching the Code of Conduct are dismissed. All dismissals must be in accordance with South African labour legislation.</li> <li>• Provide opportunities for workers to go home over weekends. The cost of transporting workers home over weekends and back to the site should be borne by the contractors.</li> <li>• On completion of the construction phase all construction workers must be transported back to their place of origin within two days of their contract ending. The costs of transportation must be borne by the contractor.</li> </ul>	<ul style="list-style-type: none"> <li>• INCA</li> <li>• INCA</li> <li>• INCA and contractors</li> <li>• INCA and contractors and CLC</li> <li>• Contractors</li> <li>• Contractors</li> <li>• Contractors</li> </ul>	<p>commences.</p> <ul style="list-style-type: none"> <li>• Code of Conduct drafted before construction phase commences.</li> <li>• Briefing session for construction workers held before they commence work on site.</li> </ul>
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Performance Indicator	<ul style="list-style-type: none"> <li>• Employment policy and tender documents that sets out local employment and targets completed before construction phase commences;</li> <li>• 80 % of semi and unskilled labour locally sourced;</li> <li>• Construction workers employed have proof that they have lived in the area for five years or longer;</li> <li>• Tender documents for contractors include recommendations for construction camp;</li> <li>• MF set up prior to implementation of construction phase;</li> <li>• Code of Conduct drafted before commencement of construction phase;</li> <li>• Briefing session with construction workers held at outset of construction phase</li> </ul>
Monitoring	<ul style="list-style-type: none"> <li>• INCA and or appointed ECO must monitor indicators listed above to ensure that they have been met for the construction phase.</li> </ul>

## Safety, poaching, stock theft and damage to farm infrastructure

### OBJECTIVE:

**To avoid and or minimise the potential impact of the activities during the construction on the safety of local communities and the potential loss of stock and damage to farm infrastructure.**

Project component/s	Construction and establishment activities associated with the establishment of the wind energy facility, including infrastructure etc.	
Potential Impact	Impact on safety of farmers and communities (increased crime etc) and potential loss of livestock due to stock theft by construction workers and also damage to farm infrastructure, such as gates and fences.	
Activity/risk source	The presence of construction workers on the site can pose a potential safety risk to local farmers and communities and may also result in stock thefts. The activities of construction workers may also result in damage to farm infrastructure.	
Mitigation: Target/Objective	To avoid and or minimise the potential impact on local communities and their livelihoods.	
Mitigation: Action/control	Responsibility	Timeframe
<ul style="list-style-type: none"> <li>• The housing of construction workers on the site should be limited to security personnel;</li> <li>• Establish a MF with the adjacent farmers and develop a Code of Conduct for construction workers.</li> <li>• Inform all workers of the</li> </ul>	<ul style="list-style-type: none"> <li>• INCA and contractors</li> <li>• INCA</li> <li>• INCA and</li> </ul>	<ul style="list-style-type: none"> <li>• Establish MF before construction phase commences.</li> <li>• Develop Code of Conduct prior to commencement of construction phase. The Code of Conduct should be signed by INCA and the contractors before the contractors move</li> </ul>

<p>conditions contained in the Code of Conduct.</p> <ul style="list-style-type: none"> <li>Dismiss all workers that do not adhere to the code of conduct for workers. All dismissals must be in accordance with South African labour legislation.</li> <li>Compensate farmers / community members at full market related replacement cost for any losses, such as livestock, damage to infrastructure etc.</li> </ul>	<p>contractor</p> <ul style="list-style-type: none"> <li>Contractors</li> <li>Contractors</li> </ul>	<p>onto site;</p> <ul style="list-style-type: none"> <li>Inform all construction workers of Code of Conduct requirements before construction phase commences.</li> <li>Compensate Farmers / community members within 1 month of claim being verified by INCA and or Contractor/s.</li> </ul>
<b>Performance Indicator</b>	<ul style="list-style-type: none"> <li>Community MF in place before construction phase commences.</li> <li>Code of Conduct developed and approved prior to commencement of construction phase.</li> <li>All construction workers made aware of Code of Conduct within first week of being employed.</li> <li>Compensation claims settled within 1 month of claim being verified by Community MF.</li> </ul>	
<b>Monitoring</b>	<ul style="list-style-type: none"> <li>INCA and or appointed ECO must monitor indicators listed above to ensure that they have been met for the construction phase.</li> </ul>	

## Impact of dust and noise due to heavy vehicles and damage to roads

### OBJECTIVE:

**To avoid and or minimise the potential impacts of safety, noise and dust and damage to roads caused by construction vehicles during the construction phase.**

<b>Project component/s</b>	Construction and establishment activities associated with the establishment of the wind energy facility, including infrastructure etc.	
<b>Potential Impact</b>	Heavy vehicles can generate noise and dust impacts. Movement of heavy vehicles can also damage roads.	
<b>Activity/risk source</b>	The movement of heavy vehicles and their activities on the site can result in noise and dust impacts and damage roads.	
<b>Mitigation: Target/Objective</b>	To avoid and or minimise the potential noise and dust impacts associated with heavy vehicles, and also minimise damage to roads.	
<b>Mitigation: Action/control</b>	<b>Responsibility</b>	<b>Timeframe</b>
<ul style="list-style-type: none"> <li>Implement dust suppression measures for heavy vehicles such as wetting roads on a regular basis and ensuring that vehicles used to</li> </ul>	<ul style="list-style-type: none"> <li>Contractors</li> </ul>	<ul style="list-style-type: none"> <li>Ensure that these conditions are included in the Construction Phase EMP.</li> <li>Ensure that dust suppression measures are implemented</li> </ul>

<p>transport sand and building materials are fitted with tarpaulins or covers.</p> <ul style="list-style-type: none"> <li>• Ensure that all vehicles are road-worthy, drivers are qualified and are made aware of the potential noise, dust and safety issues;</li> <li>• Ensure that drivers adhere to speed limits. Vehicles should be fitted with recorders to record when vehicles exceed the speed limit;</li> <li>• Ensure that damage to roads is repaired before completion of construction phase.</li> </ul>	<ul style="list-style-type: none"> <li>• Contractors</li> <li>• Contractors</li> <li>• Contractors</li> </ul>	<p>for all heavy vehicles that require such measures during the construction phase commences.</p> <ul style="list-style-type: none"> <li>• Ensure that drivers are made aware of the potential safety issues and enforcement of strict speed limits when they are employed.</li> <li>• Fit all heavy vehicles with speed monitors before they are used in the construction phase.</li> <li>• Assess road worthy status of heavy vehicles at the outset of the construction phase and on a monthly basis thereafter;</li> <li>• Ensure that damage to roads is repaired before completion of construction phase.</li> </ul>
<p><b>Performance Indicator</b></p>	<ul style="list-style-type: none"> <li>• Conditions included in the Construction Phase EMP.</li> <li>• Dust suppression measures implemented for all heavy vehicles that require such measures during the construction phase commences.</li> <li>• Drivers made aware of the potential safety issues and enforcement of strict speed limits when they are employed.</li> <li>• All heavy vehicles equipped with speed monitors before they are used in the construction phase.</li> <li>• Road worthy certificates in place for all heavy vehicles at outset of construction phase and up-dated on a monthly basis.</li> </ul>	
<p><b>Monitoring</b></p>	<ul style="list-style-type: none"> <li>• INCA and or appointed ECO must monitor indicators listed above to ensure that they have been met for the construction phase.</li> </ul>	

## Impact on farming activities

### OBJECTIVE:

**To avoid and or minimise the potential impact on current and future farming activities during the construction phase.**

<p><b>Project component/s</b></p>	<p>Construction phase activities associated with the establishment of the wind energy facility and associated infrastructure.</p>
<p><b>Potential Impact</b></p>	<p>The footprint of the solar energy facility and associated infrastructure will result in a loss of land that will impact on farming activities on the site.</p>
<p><b>Activity/risk source</b></p>	<p>The footprint taken up by the solar energy facility and associated infrastructure.</p>
<p><b>Mitigation:</b></p>	<p>To minimise the loss of land taken up by the solar energy facility</p>

<b>Target/Objective</b>	and associated infrastructure and to enable farming activities to continue where possible, specifically grazing.	
<b>Mitigation: Action/control</b>	<b>Responsibility</b>	<b>Timeframe</b>
<ul style="list-style-type: none"> <li>Minimise the footprint of the solar energy facility and the associated infrastructure.</li> <li>Rehabilitate disturbed areas on completion of the construction phase. Details of the rehabilitation programme should be contained in the EMP.</li> </ul>	<ul style="list-style-type: none"> <li>ECO and INCA</li> <li>ECO and Contractors</li> </ul>	<ul style="list-style-type: none"> <li>Footprint for wind energy facility should be defined in the Construction EMP before construction phase commences.</li> <li>Rehabilitation should be ongoing and completed within 3 months of the completion of the construction phase.</li> </ul>
<b>Performance Indicator</b>	<ul style="list-style-type: none"> <li>Footprint of solar energy facility included in the Construction Phase EMP.</li> <li>Meeting/s held with farmers during construction phase.</li> </ul>	
<b>Monitoring</b>	<ul style="list-style-type: none"> <li>ECO must monitor indicators listed above to ensure that they have been met for the construction phase.</li> </ul>	

## OPERATIONAL PHASE

### Creation of employment and business opportunities

#### OBJECTIVE:

**Maximise local employment and business opportunities associated with the operational phase.**

<b>Project component/s</b>	Day to day operational activities associated with the solar energy facility including maintenance etc.	
<b>Potential Impact</b>	The opportunities and benefits associated with the creation of local employment and business should be maximised	
<b>Activity/risk source</b>	The operational phase of the solar energy facility will create approximately 80 full time employment opportunities.	
<b>Mitigation: Target/Objective</b>	In the medium to long term employ as many locals as possible to fill the 80 full time employment opportunities.	
<b>Mitigation: Action/control</b>	<b>Responsibility</b>	<b>Timeframe</b>
<ul style="list-style-type: none"> <li>• INCA should commit to implementing a 5-year training and skills development and training programme.</li> <li>• Identify local members of the community who are suitably qualified or who have the potential to be employed full time.</li> </ul>	<ul style="list-style-type: none"> <li>• INCA</li> <li>• INCA</li> </ul>	<ul style="list-style-type: none"> <li>• Develop 5 year training and skills development programme during the construction phase.</li> <li>• Identify local members of the community who are suitably qualified or who have the potential to be employed full time during the construction phase.</li> </ul>
<b>Performance Indicator</b>	<ul style="list-style-type: none"> <li>• 5 year training and skills development programme developed and designed before construction phase completed;</li> <li>• Potential locals identified before construction phase completed.</li> </ul>	
<b>Monitoring</b>	<ul style="list-style-type: none"> <li>• INCA must monitor indicators listed above to ensure that they have been met for the operational phase.</li> </ul>	

## DECOMMISSIONING PHASE

### Impact of decommissioning

#### OBJECTIVE:

To avoid and or minimise the potential impacts associated with the decommissioning phase.

Project component/s	Decommissioning phase of the solar energy facility.	
Potential Impact	Decommissioning will result in job losses, which in turn can result in a number of social impacts, such as reduced quality of life, stress, depression etc. However, the number of people affected (50) is relatively small. Decommissioning is also similar to the construction phase in that it will also create temporary employment opportunities.	
Activity/risk source	Decommissioning of the solar energy facility.	
Mitigation: Target/Objective	To avoid and or minimise the potential social impacts associated with decommissioning phase of the solar energy facility.	
Mitigation: Action/control	Responsibility	Timeframe
<ul style="list-style-type: none"> <li>Retrenchments should comply with South African Labour legislation of the day.</li> </ul>	<ul style="list-style-type: none"> <li>INCA</li> </ul>	<ul style="list-style-type: none"> <li>When solar energy facility is decommissioned.</li> </ul>
Performance Indicator	<ul style="list-style-type: none"> <li>South African Labour legislation relevant at the time.</li> </ul>	
Monitoring	<ul style="list-style-type: none"> <li>INCA and Department of Labour.</li> </ul>	