

**SOCIAL IMPACT ASSESSMENT  
ACED MIDDLEBURG PHOTOVOLTAIC  
SOLAR ENERGY FACILITY  
EASTERN CAPE PROVINCE**

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**Prepared for**

**SAVANNAH ENVIRONMENTAL**

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## **EXECUTIVE SUMMARY**

### **INTRODUCTION AND LOCATION**

Savannah Environmental (Pty) Ltd were appointed by African Clean Energy Developments (Pty) Ltd (ACED) as the lead consultants to manage the Basic Assessment (BA) process for the establishment of a proposed Photovoltaic Solar Energy Facility (PVSEF) and associated infrastructure on two adjacent sites located ~ 20 km north of the town of Middelburg in the Eastern Cape Province, South Africa.

Tony Barbour Environmental Consulting was appointed by Savannah to undertake a specialist Social Impact Assessment (SIA) as part of the BA process. This report contains the findings of the Social Impact Assessment undertaken as part of the BA process.

### **DESCRIPTION OF THE PROPOSED PVSEF Plant**

The proposed project area was previously investigated by ACED for the establishment of a wind energy facility. However this project was deemed unfeasible due to the limited wind resource measured on the site. The site has shown to be potentially viable for the development of a PVSEF.

The proposed PV Solar project will be split into two development phases generating up to 75MW each. The development phases are referred to as Middleburg Solar Park 1 and Middleburg Solar Park 2. Each of these parks will to be operated by a Special Purpose Vehicle (SPV) to be established for the project. Separate Environmental Authorisations are therefore required for each solar park. However, a single Environmental Assessment process is being undertaken as the sites are adjacent to one another.

Solar energy facilities, such as those using PVSEF 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 PVSEF panels will be fixed to a support structure and will track the movement of the sun so as to receive the maximum amount of solar radiation. The PVSEF panels are designed to operate continuously for more than 20 years, unattended and with low maintenance.

The basic infrastructure associated with proposed Middelburg Solar Park PVSEF would include:

- Mounting structures to support the PV panels;
- Cabling between the project components, to be laid underground where practical;
- Connection to the existing Ludlow substation which is located on the site;
- Internal access roads; and
- Office building / workshop.

## **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 Social Impact Assessment variables and social change processes 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
- 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 BA 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

## **Policy and planning issues**

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);
- Eastern Cape Provincial Growth and Development Plan (2004-2014);
- The Chris Hani District Municipality Integrated Development Plan (IDP) (2007-2012);
- The Inxuba Yethemba Local Municipality Integrated Development Plan (IDP) (2011-2012).

The findings of the review indicated that renewable energy, including solar energy, is strongly supported at a national level. The findings of the review indicated that solar energy was strongly supported at a national level. Although the ECPGDP, CHDM IDP and IYLM IDP do not make specific reference to renewable energy, they all highlight the importance of energy infrastructure and a reliable supply of energy for economic development. Based on this it is reasonable to assume that the establishment of well-located PVSEF's are supported.

## **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 capital expenditure associated with the construction of a 150 MW PVSEF (Solar Park 1 and 2) will be in the region of R 4 billion (current value). The construction phase is expected to extend over a period of 24-36 months and create approximately 200 employment opportunities at peak construction. Approximately 20% (40) of the employment opportunities will be available to skilled personnel (engineers, electricians, mechanics, skilled machine drivers, management and supervisory), 20% (40) to semi-skilled personnel (drivers, equipment operators), and ~ 60% (120) to low skilled personnel (construction labourers, security staff).

The majority of the employment opportunities, specifically the low and semi-skilled opportunities which make up ~ 160 jobs, are likely to be available to local residents in the area, specifically residents from Middleburg. 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. In the absence of specific commitments from the developer to employ locals the potential for job creation for members from the local community may be limited.

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 (~24-36 months).

**Potential negative impacts**

- Impacts associated with the presence of construction workers on site
- Influx of job seekers to the area;
- 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.

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 (i.e. contract HIV/ AIDS) was assessed to be of 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>	Low (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) High (Negative impact of individuals)	Low (Negative impact for community as a whole) High (Negative impact of individuals)
<b>Influx of job seekers</b>	Low	Low
<b>Risk of stock theft, poaching and damage to farm infrastructure</b>	Medium (Negative impact)	Low (Negative impact)
<b>Risk of veld fires</b>	High (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>	High (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;
- Benefits associated with the establishment of a community trust funded by revenue from the sale of energy;
- 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 approximately 80% (40) will be low and medium-skilled and 20% (10) high skilled positions. The majority of the beneficiaries are therefore likely to be historically disadvantaged (HD) members of the community from Middleburg, Colesburg and Cradock.

Over time 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 IYLM IDP.

The establishment of a community trust funded by revenue generated from the sale of energy from the proposed PVSEF also creates an opportunity to support local economic development in the area. ACED has indicated that they are committed to establishment of a community trust. Community trusts provide an opportunity to generate a steady revenue stream that is guaranteed for a 20 year period. The revenue from the proposed PVSEF plant can be used to support a number of social and economic initiatives in the area, including:

- Education;
- Farming, including irrigation projects;
- Training and skills development;
- Support for SMME's.

The long term duration of the revenue stream also allows local municipalities and communities to undertake long term planning for the area. Experience has however also shown that community trust can be mismanaged. This issue will need to be addressed in order to maximise the potential benefits associated with the establishment of a community trust.

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 social benefit for society as a whole.

### **Potential negative impacts**

- The visual impacts and associated impact on sense of place;
- Potential impact on tourism.

The findings of the SIA indicate that the significance of the potential visual impacts and impact on tourism will be low. 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)	Medium (Positive impact)
<b>Benefits associated with the establishment of a community trust</b>	Medium (Positive impact)	High (Positive impact)
<b>Establishment of infrastructure for the generation of renewable energy</b>	Medium (Positive impact)	Medium (Positive 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 Middleburg PVSEF plant, are largely linked to the impact on sense of place and visual impacts. In the case of the proposed Middleburg PVSEF plant the significance of the potential cumulative social impacts, specifically the impact on the landscape, was rated to be low.

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 PVSEF plants 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 key roads in the area, such as the N9. Given the importance of the N9, the potential for sequential visibility impacts (e.g. the effect of seeing two or more wind farms (solar facilities) along a single journey do exist. This is an issue that the national and provincial environmental authorities need to take into account when considering the location of renewable energy facilities, specifically facilities located near national roads and important tourist routes.

### **Transmission lines**

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

### **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 negative social cost.

The No-Development option would also result in a loss in employment opportunities associated with both the construction and operational phase. In addition, the benefits associated with the establishment of a community trust funded by revenue generated from the sale of energy from the PVSEF would be forfeited. The revenue from the proposed PVSEF plant can be used to support a number of social and economic initiatives in the area. These benefits would be forgone if the proposed PVSEF plant is not developed. Given the limited economic opportunities in the area this would represent a significant negative social cost for the local community.

### **Decommissioning phase**

Given the number of people affected (~ 50), the decommissioning of the facility does have the potential to have a negative social impact on the local community. However, 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). However, 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).

ACED 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 20 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.

### **RECOMMENDATIONS**

The findings of the SIA indicate that the development of the proposed Middleburg PVSEF plant will create employment and business opportunities for locals during both the construction and operational phase of the project. The establishment of a community trust funded by revenue generated from the sale of energy from the proposed PVSEF also creates an opportunity to support local economic development in the area. This represents a significant social benefit for an area where there are limited opportunities.

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 ACED Middleburg PVSEF is therefore supported by the findings of the SIA.

### **IMPACT STATEMENT**

The findings of the SIA undertaken for the proposed ACED Middleburg PVSEF indicate that the development will create employment and business opportunities for locals during both the construction and operational phase of the project. The establishment of a community trust also creates an opportunity to support local economic development in the area. 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.



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.

## TABLE OF CONTENTS

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EXECUTIVE SUMMARY .....	i
SECTION 1: INTRODUCTION.....	1
1.1 INTRODUCTION.....	1
1.2 TERMS OF REFERENCE.....	2
1.3 PROJECT LOCATION .....	2
1.4 PROJECT DESCRIPTION.....	3
1.5 APPROACH TO STUDY .....	6
1.5.1 Definition of social impacts.....	6
1.5.2 Timing of social impacts.....	7
1.6 ASSUMPTIONS AND LIMITATIONS .....	7
1.6.1 Assumptions .....	7
1.6.2 Limitations.....	8
1.7 SPECIALIST DETAILS.....	8
1.8 DECLARATION OF INDEPENDENCE.....	9
1.9 REPORT STRUCTURE .....	9
SECTION 2: DESCRIPTION OF STUDY AREA.....	10
2.1 INTRODUCTION.....	10
2.2 ADMINISTRATIVE CONTEXT.....	10
2.3 PROVINCIAL CONTEXT.....	10
2.4 SOCIO-ECONOMIC OVERVIEW OF THE PROPOSED PROJECT AREA .....	13
3.2.1 Chris Hani District Municipality.....	13
3.2.2 Inxuba Yethemba Local Municipality .....	14
2.4.1 Ward 3 - Middelburg and Surrounds.....	16
2.6 SURROUNDING LAND USES.....	19
SECTION 3: POLICY AND PLANNING CONTEXT .....	25
3.1 INTRODUCTION.....	25
3.2 NATIONAL LEVEL ENERGY POLICY .....	25
3.2.1 NATIONAL ENERGY ACT (ACT No 34 OF 2008) .....	25
3.2.2 White Paper on the Energy Policy of the Republic of South Africa .....	25
3.2.3 White Paper on Renewable Energy.....	26
3.2.4 Integrated Resource Plan for Electricity (2010-2030) .....	27
3.3 PROVINCIAL LEVEL POLICY AND PLANNING .....	29
3.3.1 Eastern Cape Province Provincial Growth and Development Programme.....	29
3.4 DISTRICT LEVEL PLANNING AND SPATIAL POLICY CONTEXT .....	30
3.4.1 Chris Hani District Municipality Integrated Development Plan 2009-2010.....	30
3.5 MUNICIPAL LEVEL PLANNING AND SPATIAL POLICY CONTEXT .....	32
3.5.1 Inxuba Yethemba Integrated Development Plan (2010) .....	32
3.6 INTERNATIONAL EXPERIENCE WITH SOLAR ENERGY PLANTS .....	33
SECTION 4: ASSESSMENT OF KEY SOCIAL ISSUES.....	34
4.1 INTRODUCTION.....	34
4.2 IDENTIFICATION OF KEY SOCIAL ISSUES.....	34
4.3 POLICY AND PLANNING ISSUES .....	34
4.4 SOCIAL IMPACTS ASSOCIATED WITH THE CONSTRUCTION PHASE.....	35
4.4.1 Creation of employment and business opportunities.....	36
4.4.2 Presence of construction workers in the area .....	38
4.4.3 Influx of job seekers to the area.....	41

4.4.4	Increased risk of stock theft, poaching and damage to farm infrastructure .....	43
4.4.5	Increased risk of veld fires .....	44
4.4.6	Impact of construction vehicles .....	46
4.4.7	Damage to and loss of farmland .....	47
4.5	SOCIAL IMPACTS ASSOCIATED WITH THE OPERATIONAL PHASE .....	49
4.5.1	Creation of employment and business opportunities .....	49
4.5.2	Benefits associated with the establishment of a community trust ...	50
4.5.3	Development of clean, renewable energy infrastructure .....	52
4.5.4	Visual impact and impact on sense of place .....	53
4.5.5	Impact on tourism .....	55
4.6	ASSESSMENT POWER LINE OPTIONS .....	55
4.7	ASSESSMENT OF NO-DEVELOPMENT OPTION .....	57
4.8	ASSESSMENT OF CUMULATIVE IMPACTS .....	58
4.9	ASSESSMENT OF DECOMMISSIONING PHASE .....	60
	SECTION 5: KEY FINDINGS AND RECOMMENDATIONS .....	61
5.1	INTRODUCTION .....	61
5.2	SUMMARY OF KEY FINDINGS .....	61
5.2.1	Policy and planning issues .....	61
5.2.2	Construction phase .....	62
5.2.3	Operational phase .....	63
5.2.4	Assessment of cumulative impacts .....	65
5.2.5	Transmission line options .....	65
5.2.6	Assessment of no-development option .....	65
5.2.7	Decommissioning phase .....	65
5.3	CONCLUSIONS AND RECOMMENDATIONS .....	66
5.4	IMPACT STATEMENT .....	66
	ANNEXURE A: .....	67
	ANNEXURE B .....	68
	ANNEXURE C .....	70

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## SECTION 1: INTRODUCTION

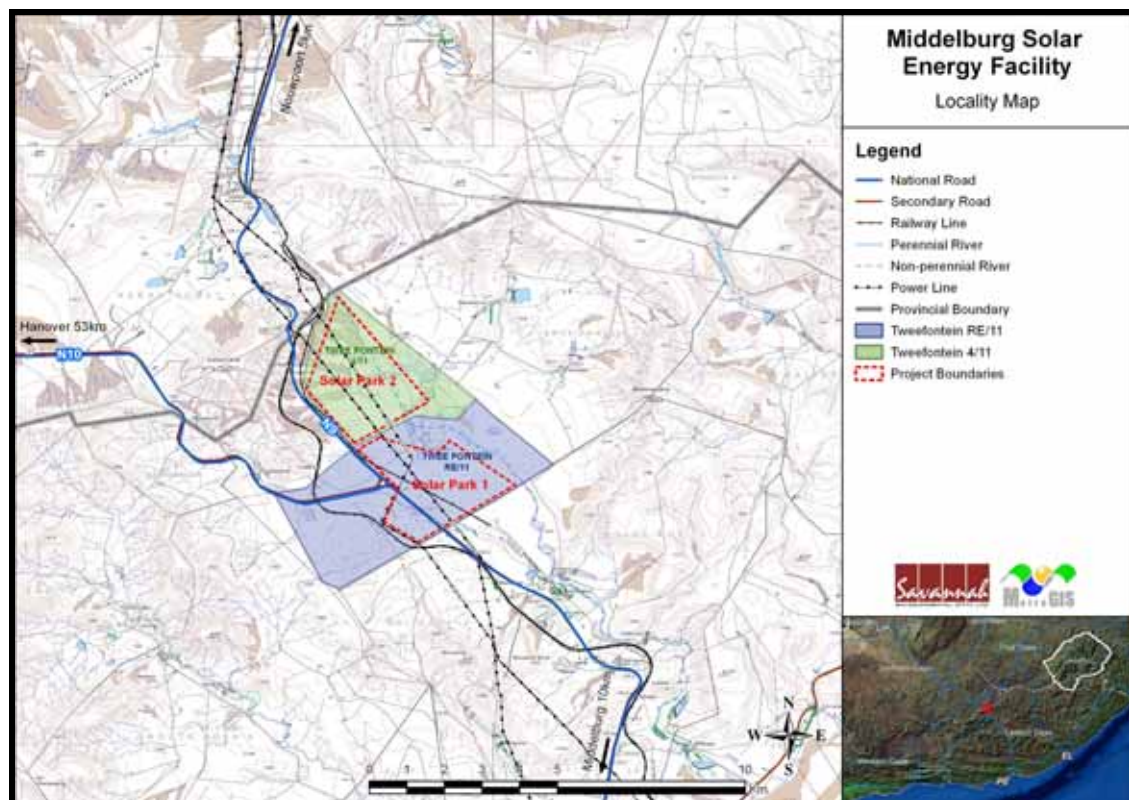
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### 1.1 INTRODUCTION

Savannah Environmental (Pty) Ltd were appointed by African Clean Energy Developments (Pty) Ltd (ACED) as the lead consultants to manage the Basic Assessment (BA) process for the establishment of a proposed 150 MW Photovoltaic Solar Energy Facility (PVSEF) and associated infrastructure on two adjacent sites in the vicinity of the town of Middelburg in the Eastern Cape Province, South Africa (Figure 1.1). The proposed PV Solar project will be split into two development phases generating up to 75MW each. The two development phases are referred to as:

- Middleburg Solar Park 1 (75 MW); and
- Middleburg Solar Park 2 (75 MW).

Tony Barbour Environmental Consulting was appointed by Savannah to undertake a specialist Social Impact Assessment (SIA) as part of the BA process. This report contains the findings of the SIA.



Source: MetroGIS

**Figure 1.1: Location of the proposed ACED Middelburg 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 facility
- A description and assessment of the potential social issues associated with the proposed facility
- Identification of enhancement and mitigation aimed at maximising opportunities and avoiding and or reducing negative impacts

## 1.3 PROJECT LOCATION

The proposed sites are located within the Inxuba Yethemba Local Municipality (LM) (EC131), ~ 20 km north of Middelburg, 53km west of Hanover and 14km south of Noupoort (Figure 1.2). Both Solar Park sites are located adjacent to the N9 between Colesberg and Middelburg with the southern portion of Solar Park 1 extending across the N9 National Highway (Figure 1.1). The site is located to the east and south of the intersection between the N9 and N10. The Inxuba Yethemba Local Municipality is one of 8 LM that fall within the greater Chris Hani District Municipality (DC13) (Figure 1.3).

The two proposed Solar Park Sites identified for the proposed PVSEF cover an area of approximately 1050 hectares and is located on Farm Beskuitsfontein, which consists of the following farm portions:

- Remainder Twee Fontein (Middleburg Solar Park 1); and
- Twee fontein 11/4 (Middleburg Solar Park 2).



Source: Wikipedia

**Figure 1.2: Location of Inxuba Yethemba Local Municipality**



Source: Wikipedia

**Figure 1.3: Location of Chris Hani District Municipality**

#### **1.4 PROJECT DESCRIPTION**

The proposed project area was previously investigated by ACED for the establishment of a wind energy facility. However this project was deemed unfeasible due to the limited wind resource measured on the site. The site has shown to be potentially viable for the development of a PV solar energy facility. As indicated above, the proposed PVSEF will be split into two development phases generating up to 75MW each. The two phases are referred to as:

- Middleburg Solar Park 1 (75 MW); and
- Middleburg Solar Park 2 (75 MW) (Figure 1.4).

An area of approximately 1045 hectares is being considered for the establishment of two Solar Parks and associated infrastructure. The identification of the site was informed by a technical feasibility study which considered the average local solar radiation resource, access to the electricity grid, accessibility of the site and local site topography. The energy will be fed into the Eskom grid via the Ludlow Substation (Photograph 1.1). The project is therefore an Independent Power Producer (IPP) project.



**Figure 1.4: Layout of Solar Park 1 and 2 and associated power lines**



**Photograph 1.1: Existing Ludlow substation located to the west of the site**

Solar energy facilities, such as those using PVSEF 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. PVSEF plants 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 PVSEF panels are fixed to a support structure and will track the movement of the sun so as to receive the maximum amount of solar radiation. The PVSEF panels are designed to operate continuously for more than 20 years, unattended and with low maintenance.



**Photograph 1.2: Example of Photovoltaic array (Source: [www.wapa.gov](http://www.wapa.gov))**

The basic infrastructure associated with proposed Middelburg Solar Park PVSEF would include:

- Mounting structures to support the PV panels;
- Cabling between the project components, to be lain underground where practical;
- Connection to the existing Ludlow substation which is located on the site (Figure 1.4);
- Internal access roads; and
- Office building / workshop.

The overall aim of the design and layout of the facility is to maximise electricity production through exposure to the solar radiation, while minimising infrastructure, operation and maintenance costs, and social and environmental impacts.

Based on the information provided by ACED the construction phase is expected to extend over a period of 24-36 months and create ~ 200 employment opportunities during peak construction. The total capital expenditure associated with the



construction phase will be ~ R 4 billion. The operational phase is expected to create approximately 50 employment opportunities for a period of 20 years.

## **1.5 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 settlements and communities likely to be affected by the proposed project
- Collecting baseline data on the current social and economic environment;
- Identifying the key potential social issues associated with the proposed project. This requires a site visit to the area and consultation with affected individuals and communities. As part of the process a basic information document was prepared and made available to key interested and affected parties. The aim of the document was to inform the affected parties of the nature and activities associated with the construction and operation of the proposed development so as to enable them to better understand and comment on the potential social issues and impacts
- Assessing and documenting the significance of social impacts associated with the proposed intervention
- Identifying alternatives and mitigation measures

In this regard the study involved:

- Review of demographic data from the 2001 Census Survey;
- Review of relevant planning and policy frameworks for the area;
- Site specific information collected during the site visit to the area and interviews with interested and affected parties;
- Review of information from similar studies, including the EIAs undertaken for other renewable energy projects, including wind energy facilities;
- Identification and assessment of the social issues associated with the proposed project.

The identification of potential social issues associated with proposed facility is based on observations during the project site visit, review of relevant documentation, experience with similar projects and the area. Annex A contains a list of the secondary information reviewed and interviews conducted. Annex B summarises the assessment methodology used to assign significance ratings to the assessment process.

### **1.5.1 Definition of social impacts**

Social impacts can be defined as “The consequences to human populations of any public or private actions (these include policies, programmes, plans and/or projects) that alter the ways in which people live, work, play, relate to one another, organise to meet their needs and generally live and cope as members of society. These impacts are felt at various levels, including individual level, family or household level, community, organisation or society level. Some social impacts are felt by the body

as a physical reality, while other social impacts are perceptual or emotional" (Vanclay, 2002).

When considering social impacts it is important to recognise that social change is a natural and on-going process (Burdge, 1995). However, it is also important to recognise and understand that policies, plans, programmes, and/or projects implemented by government departments and/or private institutions have the potential to influence and alter both the *rate* and *direction* of social change. Many social impacts are not in themselves "impacts" but change process that may lead to social impacts (Vanclay, 2002). For example the influx of temporary construction workers is in itself not a social impact. However, their presence can result in range of social impacts, such as increase in antisocial behaviour. The approach adopted by Vanclay stresses the importance of understanding the processes that can result in social impacts. It is therefore critical for social assessment specialists to think through the complex causal mechanisms that produce social impacts. By following impact pathways, or causal chains, and specifically, by thinking about interactions that are likely to be caused, the full range of impacts can be identified (Vanclay, 2002).

An SIA should therefore enable the authorities, project proponents, individuals, communities, and organisations to understand and be in a position to identify and anticipate the potential social consequences of the implementation of a proposed policy, programme, plan, or project. The SIA process should alert communities and individuals to the proposed project and possible social impacts, while at the same time allowing them to assess the implications and identify potential alternatives. The assessment process should also alert proponents and planners to the likelihood and nature of social impacts and enable them to anticipate and predict these impacts in advance so that the findings and recommendations of the assessment are incorporated into and inform the planning and decision-making process.

However, the issue of social impacts is complicated by the way in which different people from different cultural, ethnic, religious, gender, and educational backgrounds etc view the world. This is referred to as the "social construct of reality". The social construct of reality informs people's worldview and the way in which they react to changes.

### **1.5.2 Timing of social impacts**

Social impacts vary in both time and space. In terms of timing, all projects and policies go through a series of phases, usually starting with initial planning, followed by implementation (construction), operation, and finally closure (decommissioning). The activities, and hence the type and duration of the social impacts associated with each of these phases are likely to differ.

## **1.6 ASSUMPTIONS AND LIMITATIONS**

### **1.6.1 Assumptions**

#### **Strategic importance of the project and no-go option**

It is assumed that the strategic importance of promoting renewable energy, including solar energy, is supported by the national and provincial energy policies.

### **Technical suitability**

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

### **Fit with planning and policy requirements**

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

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

### **Generic issues relating to renewable energy**

A number of the key authorities in the other parts of South Africa, specifically the Northern Cape Province, have been interviewed as part of the SIAs for other solar energy projects. For the purpose of the Middleburg SIA it is assumed that the generic issues raised relating to renewable energy, and specifically solar energy, also apply to the proposed Middleburg PVSEF plant.

## **1.6.2 Limitations**

### **Demographic data**

The demographic data used in the study is largely based on the 2001 Census<sup>1</sup>. While this data does provide useful information on the demographic profile of the affected area, the data are dated and should be treated with care. Where possible, reference is made to the latest demographic data contained in local Integrated Development Plans and other documents.

In addition, there is no longer any access to Census 2001 data at Ward level via the Municipal Demarcation Board. However, for the purposes of this study it was possible to source ward level information from a previous study undertaken in the area.

## **1.7 SPECIALIST DETAILS**

The lead author of this report is an independent specialist with 23 years' experience in the field of environmental management. His qualifications include a BSc, BEcon (Hons) and an MSc in Environmental Science. In terms of SIA experience Tony Barbour has undertaken in the region of 120 SIAs and is the author of the Guidelines for Social Impact Assessments for EIAs adopted by the Department of Environmental Affairs and Development Planning (DEA&DP) in the Western Cape in 2007. These

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<sup>1</sup> The last comprehensive national census was conducted in 2001. Census 2001 provided demographic and socio-economic data from National to Municipal Ward level. An interim Community Survey (sample based) was undertaken in 2007, but provided information only on provincial and municipal levels. The next comprehensive national census is planned for 2011.

guidelines are based on international best practice and have been used widely in South Africa. Tony Barbour has also undertaken specialist SIA studies for over 20 PVSEFs in South Africa.

Daniel Rogatschnig has an MSc in Environmental Science and has five years of experience as an environmental consultant. He has also worked on a number of SIAs with Tony Barbour throughout South Africa.

## **1.8 DECLARATION OF INDEPENDENCE**

This confirms that Tony Barbour and Daniel Rogatschnig, the specialist consultants responsible for undertaking the study and preparing the Draft SIA Report, are independent and do not have vested or financial interests in the proposed Schmidtsdrift PVSEF plant being either approved or rejected.

## **1.9 REPORT STRUCTURE**

The report is divided into five sections, namely:

- Section 1: Introduction
- Section 2: Overview of the study area
- Section 3: Summary of key policy and planning documents relating to solar energy and the area in question
- Section 4: Identification and assessment of key social issues
- Section 5: Summary of key findings and recommendations

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## **SECTION 2: DESCRIPTION OF STUDY AREA**

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### **2.1 INTRODUCTION**

Section 2 provides an overview of:

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

### **2.2 ADMINISTRATIVE CONTEXT**

The proposed site is located in the Inxuba Yethemba LM (IYLM) which is one of eight local municipalities and a district management area that make up the Chris Hani District Municipality (CHDM) (DC13), which is located in the central part of the Eastern Cape Province. The other seven local municipalities are the Intsika Yethu LM, Lukanji LM, Engcobo LM, Emalahleni LM, Sakhisizwe LM, Tsolwana LM and Inkwanca LM.

The CHDM is one of the seven (7) District Municipalities (including Nelson Mandela Bay Metropolitan Municipality) in the Eastern Cape Province. The District is situated in the central portion of the Province, bordering the Northern Cape and 4 other District Municipalities in the Eastern Cape, namely the Ukhahlamba DM (DC14) to the north, the OR Tambo DM (DC15) to the north-east, the Amatole DM (DC12) to the south and the Chris Hani DM (DC10) to the south-west.

The main settlements on the IYLM are Middleburg and Cradock. Middleburg is the administrative seat of the IYLM.

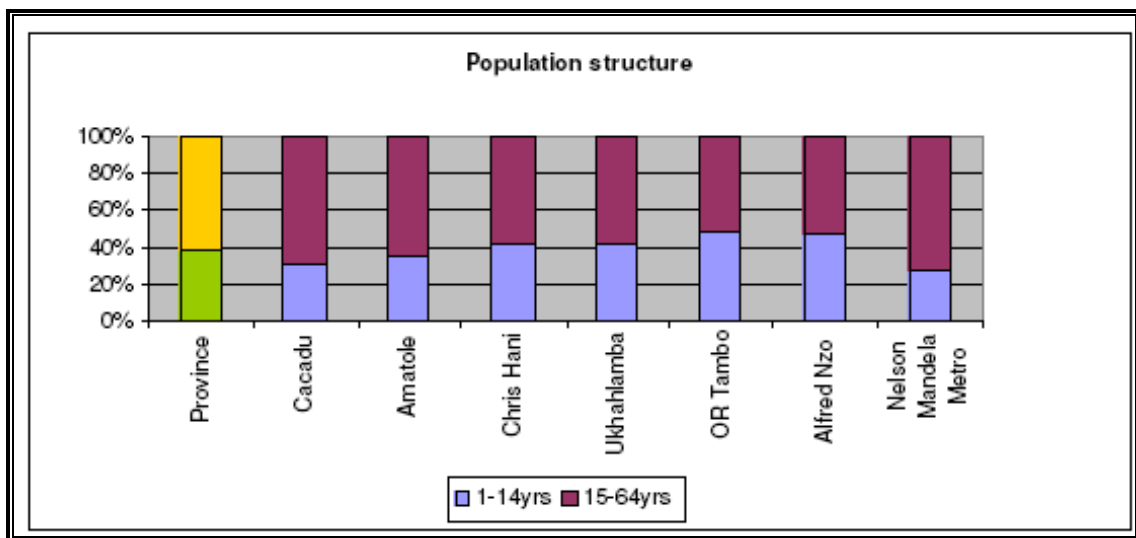
### **2.3 PROVINCIAL CONTEXT**

The proposed Middelburg Solar Park PVSEF is located within the Chris Hani District Municipality of the Eastern Cape Province of South Africa. The Eastern Cape Province is the second largest province in terms of land area in South Africa (169 580 km<sup>2</sup>) and makes up 13.9% of South Africa's total land area. The province contributes 7.5 % to the countries total GDP and with 14.1 % of South Africa's population it is the countries third most populous province. Of this total almost 40% are under the age of 14 years. In the case of the Alfred Nzo and OR Tambo (Oliver Tambo) districts, this proportion exceeds 45% (Figure 2.1).

The high proportion of children is reflective of Eastern Cape's historic role as a major source of migrant labour (Austrian Development Agency, 2005). Migration from the Eastern Cape to other provinces, specifically the Western Cape, still continues today.

Life expectancy in the province has dropped over the past decade from 60 years in 1995 to 50 years in 2003 (Austrian Development Agency, 2005). There are two major urban centers within the Province, the Nelson Mandela Metropolitan Area and Buffalo City Municipality (BCM). With the exception of the Nelson Mandela Metro and Buffalo City, the province is predominantly rural in character.

The Eastern Cape is also the poorest province in South Africa, with seven of the poorest Local Municipalities in the country located in province, namely Umzimvubu (Alfred Nzo DM), Ntabankulu (OR Tambo DM), Mbizana (OR Tambo DM), Mbhashe (Amatole DM), Ngqushwa (Amatole DM), Elundini (Ukhahlamba DM) and Intsika Yethu (Chris Hani DM). The high levels of poverty in the province are linked to the inclusion of the two former apartheid era Bantustan areas, namely the Transkei and Ciskei, into the Eastern Cape (Austrian Development Agency, 2005).

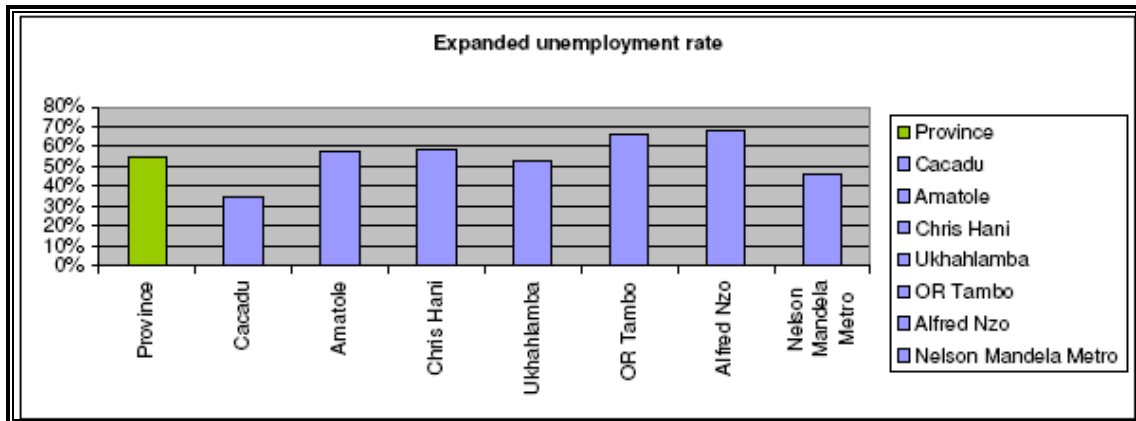


Source: Austrian Development Agency (2005)

**Figure 2.1: Age distribution with the Eastern Cape Province**

Although the Eastern Cape is the poorest province in the country, there is a distinct variation in both the distribution and severity of poverty within the province. In this regard a distinction can be made between those areas that were formerly part of the Ciskei and the Transkei (in particular OR Tambo, Alfred Nzo, but also large parts of Ukhahlamba, Amatole and Chris Hani), and those areas that were administered by the former white South Africa (in particular Chris Hani) (Austrian Development Agency, 2005).

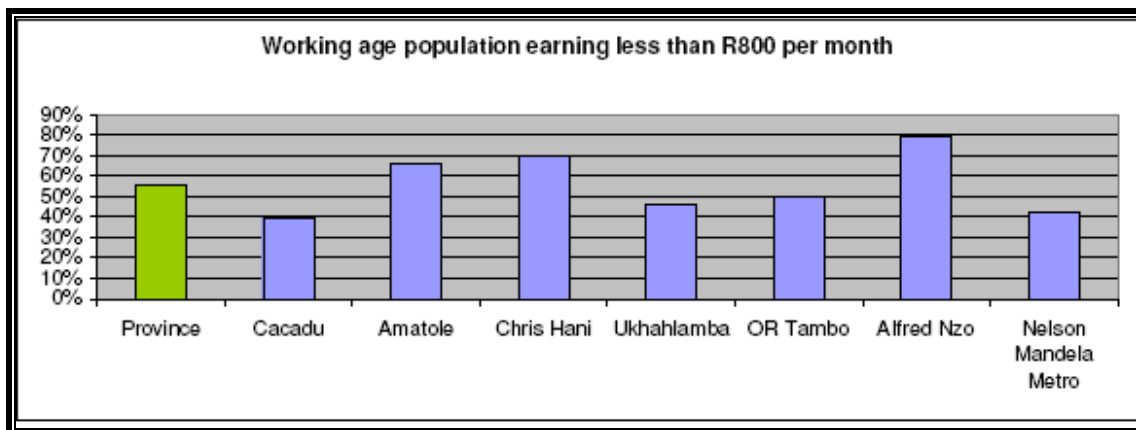
In terms of unemployment rates, the OR Tambo and Alfred Nzo Districts have the highest rates, followed by Chris Hani and Amatole. All of these districts have unemployment rates higher than the provincial average (Figure 2.2). The Chris Hani District Municipality has the lowest unemployment rate in the province.



Source: Austrian Development Agency (2005)

**Figure 2.2: Expanded unemployment rate for the Eastern Cape Province**

In addition to the high unemployment levels, income levels are also low. A large proportion of those that are employed therefore earn less than R800 per month. In the case of Alfred Nzo, Chris Hani and Amatole districts, over 60% of those employed earn less than R800 per month (Figure 2.3). The figure for the Chris Hani district is 40%.



Source: Austrian Development Agency (2005)

**Figure 2.3: Percentage of working age population earning less than R800 per month**

In addition to the high unemployment rates and low-income levels, there has also been an increase in inequality as measured by the Gini coefficient<sup>2</sup> since 1995. In 1995 the figure stood at 0.61. By 2001 the coefficient had increased to 0.66. Similarly, in relation to human development indices, the situation has also deteriorated (Austrian Development Agency, 2005).

In response to these challenges, the Eastern Cape Province has been earmarked by the ANC as a priority for growth and economic development. To facilitate

<sup>2</sup> The Gini coefficient is a measure of statistical dispersion most prominently used as a measure of inequality of income distribution or inequality of wealth distribution. It is defined as a ratio with values between 0 and 1: A low Gini coefficient indicates more equal income or wealth distribution, while a high Gini coefficient indicates more unequal distribution (Source, Wikipedia.org)

development, two spatial development initiatives (SDIs), the Fish River SDI and the Wild Coast SDI, two Industrial Development Zones (IDZs), the Coega IDZ near the Nelson Mandela Metropole (Port Elizabeth) and the West Bank IDZ near East London, and numerous substructure and structure plans have been initiated. The IDZ initiatives are linked to two of the province's three harbours (i.e. Coega and East London). In addition the province has three airports offering direct flights to the main centres, and a well-developed road infrastructure. In terms of context, the proposed Middelburg Solar Park PSEF is located approximately 350 km north of the Nelson Mandela Metropole and the Coega IDZ. The facility therefore has the potential to supplement the future energy needs of these two large consumers. The location of the site will also significantly reduce the transmission losses experienced by Eskom in the transmission of electricity from Gauteng and Mpumalanga to the Eastern Cape.

## **2.4 SOCIO-ECONOMIC OVERVIEW OF THE PROPOSED PROJECT AREA**

As indicated in Section 1.5.2 Limitations, it is no longer possible to access Census 2001 data at Ward level via the Municipal Demarcation Board. However, it was possible to source information for Ward 1 from previous work undertaken by the consultants in the area. The proposed PVSEF project is located in the Inxuba Yethemba Local Municipality.

### **3.2.1 Chris Hani District Municipality**

The Chris Hani District Municipality (CDM), DC13, is one of the seven (7) District Municipalities (including Nelson Mandela Bay Metropolitan Municipality) in the Eastern Cape Province. The District is situated in the central portion of the Province, bordering the Northern Cape and 4 other District Municipalities in the Eastern Cape, namely the Ukhahlamba DM (DC14) to the north, the OR Tambo DM (DC15) to the north-east, the Amatole DM (DC12) to the south and the Chris Hani DM (DC10) to the south-west. The District consists of eight (8) local municipalities (Category B Municipalities) namely:

- Intsika Yethu LM
- Lukanji LM
- Engcobo LM
- Emalahleni LM
- Inxuba Yethemba LM
- Sakhisizwe LM
- Tsolwana LM
- Inkwanca LM

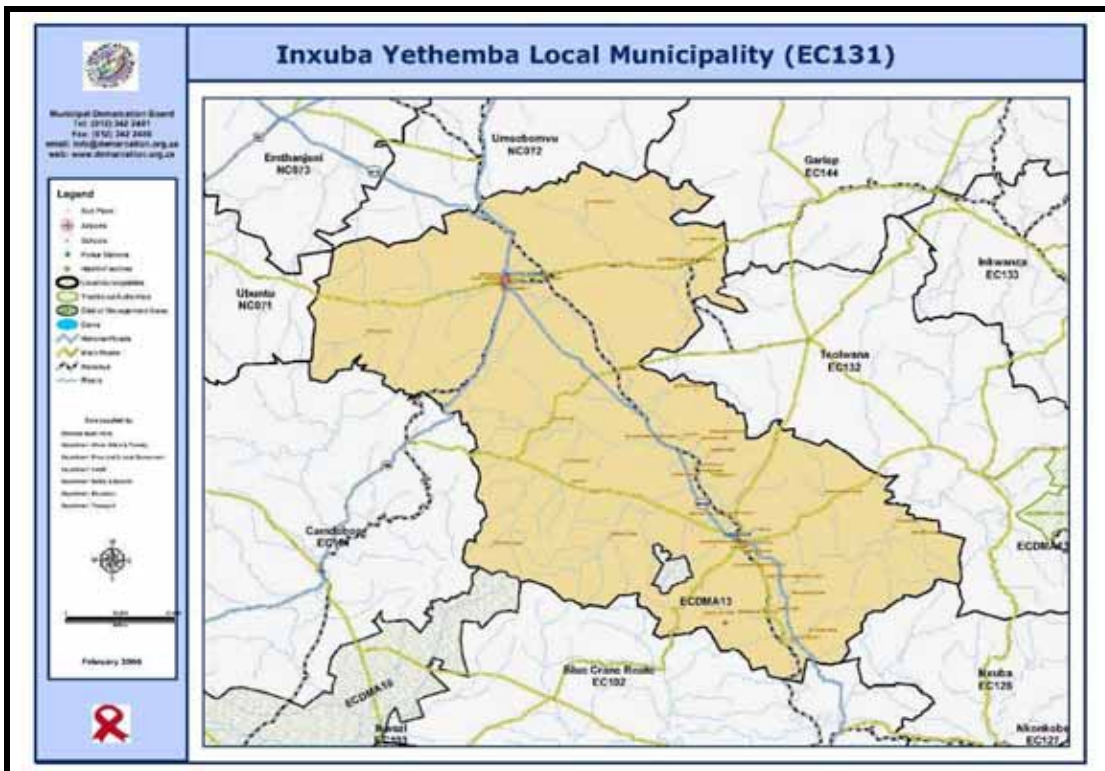
The Chris Hani District covers an area of 37 294 km<sup>2</sup> which equates to roughly a fifth of the Eastern Cape's total land area. The DM is home to ~12.6% of the provinces' population concentrated in main town of Queenstown (DM administrative centre) Craddock, Middleburg, Elliot and Engcobo. Due to the relatively moderate population size and relatively large geographical area, the population density was 22 persons per km<sup>2</sup> in 2001 in the Chris Hani District Municipality. This is moderately lower than that of the Eastern Cape and South Africa (both 32 people/ km<sup>2</sup> in 2001).



### 3.2.2 Inxuba Yethemba Local Municipality

The proposed project area is located approximately 20 km north of the town of Middelburg within the Inxuba Yethemba Local Municipality (LM) (EC131), Eastern Cape Province.

The Inxuba Yethemba LM (Figure 2.1) is a category-B Municipality<sup>3</sup>, which forms part of the greater Chris Hani District Municipality (DC13, category-C Municipality) and is located in the central part of the Eastern Cape, approximately 224 km north of the Nelson Mandela Metropolitan area (Port Elizabeth), and 237 km north-west of the Provincial capital of Bhisho. The Inxuba Yethemba LM covers an area of 11 592km<sup>2</sup> and the settlement pattern is characterised by two prominent urban settlements, namely Cradock and Middelburg, which lie 224 km and 345 km north of Port Elizabeth respectively. The urban areas are typical of the spatial patterns of towns throughout South Africa, namely they are segregated by economic classes and reside in clusters. The administrative center of the LM is Cradock.



Source: Municipal Demarcation Board

**Figure 2.1: Inxuba Yethemba Local Municipality**

The municipality is bordered in the west by the Camdeboo and Blue Crane Route Local Municipalities (part of the Chris Hani District Municipality), in the south by the Nxuba Local Municipality (part of the Amathole District Municipality), in the north by the Umsobomvu Local Municipality (part of the Pixley ka Seme District Municipality in

<sup>3</sup> A category-B municipality is defined as a municipality that shares executive and legislative authority in its area with a category- C municipality within whose area it falls

the Northern Cape) and the east by the Tsolwana Local Municipality (part of the Amatole District Municipality).

The population the Inxuba Yethemba LM is estimated at 58 054 (based on the 2009 Local Economic Development Strategy document drafted by the municipality), which constitutes approximately 7.4% of the greater Chris Hani District. The average population growth is declining at an estimated 0.6% per annum. Only a fifth of the population (~20%) live in rural villages, homesteads and settlements. The remaining population resides in the two major urban nodes of Cradock and Middelburg. Given the size of the Municipality and the relatively small total population size, the population density within the Municipality is low at ~5 people per km<sup>2</sup>.

The age profile of the population reveals that approximately 60.9% of the population falls within the potentially economically active 15 to 60 year old age bracket. The 14 years and under age group constitutes 30.2% of the population, while the over 60 age group make up ~8.9% of the total population

The dependency ratio<sup>4</sup> is 0.64 (throughout the whole Local Municipality), which means that every working individual supports approximately 1 non-working/unemployed individual. However, according to the Integrated Development Plan (2007) the dependency ratio is significantly higher in the urban areas ranging between 1.78 (Cradock) and 1.81 (Middelburg).

The population is largely Black African (53.9%) followed by Coloured (35%), White (11%) and Asian (0.07%). These demographics are reflected in the dominant languages within the Municipality with 52.9% of the population speaking isiXhosa speaking, 45.5% speaking Afrikaans, 1.4% speaking English and the remainder speaking other indigenous African languages.

Broadly, the level of education within the Municipality is low. Approximately 11% of persons over the age of 20 year or older have no schooling at all, while less than half of those with a Std 10/Grade 12 certificate (~11%) progress to obtain education at University/Technikon level (~5%). That being said, education levels or the adult population within the municipality have increased with the percentage of individuals that have some form of tertiary education increasing from 6% to 10% between 2001 and 2007.

Economically, the Inxuba Yethemba Local Municipality contributed approximately R1.7 Billion in terms of its Gross Geographic Product (GGP) in 2007 to the national Gross Domestic Product (GDP), which constitutes approximately 0.1% of the national economy. The largest sectors within the municipality in 2007 were Finance and Business Services (~22%), General Government Services (~21%), Trade (~18%), Agriculture (~10%), Manufacturing (~7%), Communications (~6.5%), Construction (~6%), Personal Services (~5%) and relatively smaller contribution from Transport (~4%), Electricity and Water (~1.5%) and Catering and Accommodation (~1%).

Employment levels in the Inxuba Yethemba Local Municipality are estimated at 40.1% according to the Local Economic Development (LED) Strategy document

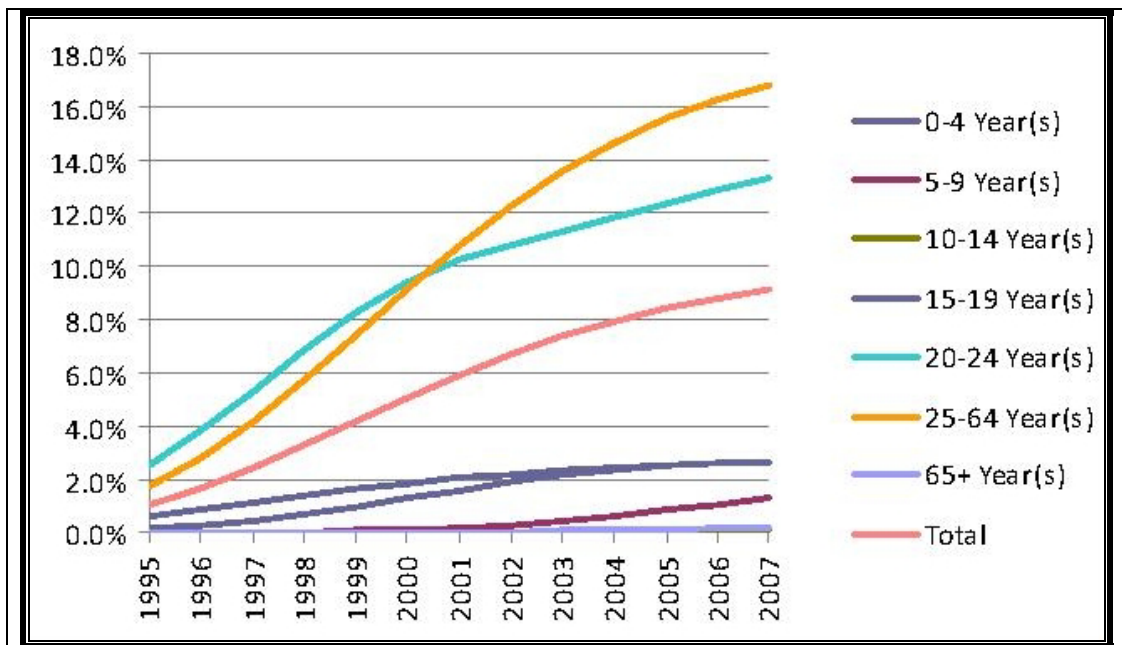
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<sup>4</sup> The dependency ratio is calculated as the number of 0 to 14-year olds, plus the number of 65-year olds and older, divided by the number of people in the 15 to 64-year old age cohort. This is to give a rough indication of dependency.

published in March 2009. While agriculture and fishing contribute only ~10% of the Gross Geographic Product (GGP), this sector employs 25% of the employed population within the Municipality. This is largely a consequence of widespread subsistence farming in the area. General Government Services employ approximately 22% of the employed population followed by Personal Services (~14%), Trade (~12%), Finance and Business Services (~12%), Construction, (~5%) and Manufacturing (~5%). Transport, Catering and Accommodation, Communications contribute the remaining ~5% of employment in the Municipality.

Unemployment within the Municipality is estimated at 24.7%, which is below the Eastern Cape average of ~32%, while 35.2% of the population is not economically active. The latter is made up of scholars/students, homemakers/housewives, pensioners, the medically unfit, seasonal workers not currently employed, those who choose not to work and those that could not find work.

In terms of health, the HIV/AIDS infection rate has increased from ~1% in 1995 to ~9% in 2007. The infection rate is highest in the young adult and adult population while the rate of infection of those under the age of 20 has stabilised at just over 2% (Figure 2.2)



IYLM LED Strategy, 2007

**Figure 2.2: HIV/AIDS infection rate within the Inxuba Yethemba Municipality**

#### 2.4.1 Ward 3 - Middelburg and Surrounds

The proposed project is located entirely within Ward 3 of the Inxuba Yethemba Local Municipality, which is the largest ward by area. The largest town in the Ward is Middelburg with a total population of 13 800, the second largest urban population in the Municipality after Cradock (28 690 people).

The demographics of this western part of the Municipality (Table 2.1) indicate that the majority of the population is Black African (74.3%) followed by Coloured (19.7%) and White (6.0%). isiXhosa is the dominant language spoken in the area, with 73.2% of the population having isiXhosa as their first language. Afrikaans is spoken by 24.9%, while 1.4% speaks English.

**Table 2.1: Breakdown of population (2001)**

Description	Number	%
Black African	4657	74.3
Coloured	1234	19.7
Indian or Asian	0	0.0
White	377	6.0

Source: Census 2001

In terms of education levels within the ward (Table 2.2) in 2001, 19.7% had no schooling, 8.0% had completed primary school (Grade 7/Std 5), and 11.9% had a Grade 12 certificate while less than 7% had a higher education.

**Table 2.2: Education levels (2001)**

Description	Number	%
No schooling	682	19.7
Some primary	1008	29.1
Complete primary	278	8.0
Some secondary	850	24.5
Std 10/Grade 12	411	11.9
Higher	236	6.8

Source: Census 2001

The employment statistics (Table 2.3) indicate that in 2001 34.7% of the ward population was employed, while the unemployment rate was 19.1%. The percentage of Non-Economically Active residents was 46.2%.

**Table 2.3: Employment levels**

Description	Number	%
Employed	1357	34.7
Unemployed	745	19.1
Not Economically Active	1804	46.2

Source: Census 2001

When one considers the age breakdown (Table 2.4) the majority of the population that are not economically active fall within the 0-15 age group (32.5%). The dependency ration within the ward is 0.62, which means that every working individual supports approximately 1 non-working/unemployed individual

**Table 2.4: Age distribution**

Description	Number	%
0-4	602	9.6
5-9	673	10.7
10-14	763	12.2
15-19	766	12.2
20-24	522	8.3
25-29	469	7.5
30-34	402	6.4
35-39	325	5.2
40-44	348	5.6
45-49	347	5.5
50-54	271	4.3
55-59	223	3.6
60-64	209	3.3
65-69	108	1.7
70-74	85	1.4
75-79	66	1.1
80 and over	91	1.5

Source: Census 2001

Statistics on household incomes (Table 2.5) in Ward 3 indicate that 63.1% of the households earn less than R9 600 per annum, which is regarded as the poverty line. Of this total 21.7% have no income.

**Table 2.5: Household income**

Description	Number	%
No income	385	21.7
R1 - R4 800	207	11.7
R4 801 - R 9 600	528	29.8
R9 601 - R 19 200	312	17.6
R19 201 - R 38 400	156	8.8
R38 401 - R 76 800	93	5.2
R76 801 - R153 600	54	3.0
R153601-R307200	31	1.7
R307201-R614400	4	0.2
R614401-R1228800	1	0.1
R1228801-R2457600	3	0.2
R2 457 601 , more	0	0.0
Not Applicable	5	0.3

Source: Census 2001

Based on the above the study area is characterized by low levels of education, relatively high unemployment and low-income levels.

## 2.6 SURROUNDING LAND USES

As indicated above, the proposed project area is located ~20 km north of Middelburg within Inxuba Yethemba Local Municipality (IULM). Middelburg is located approximately 347 km north of Port Elizabeth and 98 km northeast of Cradock, the administrative capital of the Inxuba Yethemba Municipality. The town of Middelburg (Photograph 2.1) is also located at the junction of the N10 (that links the N2 at Coega with the B3 at the Namibian Border) and the N9 (that links the N2 at George to the N1 at Colesberg) and is bisected east-west by the R56 and the R398 (Photograph 2.1). The R56, the shortest route between the Western Cape and Kwazulu-Natal starts at Middelburg.



**Photograph 2.1: View of Meintjies Street (N10), the main thoroughfare through Middelburg**

Middelburg was established 1852 and got its name from the fact that it is located midway between Graaff-Reinet (to the south) and Colesburg (to the north). The town is also located ~ midway between Port Elizabeth and Bloemfontein. The town and surrounding areas have a rich history that is linked to the Anglo Boer War. In this regard the well-known Grootfontein College of Agriculture was originally established as a military camp and training centre for British troops. Approximately 7 000 troops from the Third Manchester Regiment were stationed at Grootfontein. In 1910 the Union of South Africa took control of the farm after which the Grootfontein School of Agriculture was established in 1911. Today the college offers a two year Certificate in Agriculture and a three year Diploma in Agriculture, both accredited by the Higher Education Quality Committee. Middelburg is also the birthplace of the famous South African playwright, Athol Fugard.

The proposed PVSEF is located adjacent to the N9 which borders the farms Remainder Twee Fontein (Middleburg Solar Park 1) and Twee fontein 11/4 (Middleburg Solar Park 2). The two sites are separated by a secondary gravel road (Photograph 2.2) that links the N9 with the neighbouring Farm Beskuitfontein. The Carlton Heights Guesthouse is also accessed via this secondary gravel road (Photograph 2.2). In addition, Study Area extends across the N9 to the railway line. The Ludlow substation is located on this section of Study Area 1, near Sherborne station (see Photograph 1.1).

The topography in the study area consists of relatively flat undulating plains interspersed with low, rounded hills. The vegetation consists largely of grass and low shrub cover (Photograph 2.2-2.4). In terms of the visual character of the area there are existing power lines that traverse both of the proposed development sites from the southeast to the northwest (Photograph 2.5).



**Photograph 2.2: View of site towards the north from the middle of Solar Park 2**



**Photograph 2.3: View of sites towards the north east from the Ludlow substation**



**Photograph 2.4: View of sites towards the south east from the N9 adjacent to Carlton Station**



**Photograph 2.5: View of power lines crossing the proposed sites**

The PSEF site is located on private, agricultural land. In terms of farmsteads, there is one farmstead and one guesthouse (Carlton farmstead and Guesthouse) located within the proposed study area (Photograph 2.6). The dominant land use activity in the area is farming, specifically livestock farming (sheep and cattle) (Photograph 2.7).





**Photograph 2.6: Homestead and Carlton Heights Guesthouse**



**Photograph 2.7: Cattle on the nearby Farm Wolwekop**

Road access to the proposed PVSEF site is via a gravel road that links up with the N9. The N9 is currently under extensive repair but otherwise well maintained (Photograph 2.8).



**Photograph 2.8: N9 in the vicinity of the site**

Access via the existing railway line is also an option. There are two railway stations located in close proximity to the site – Sherborne and Carlton (Photograph 2.9 and 2.10). Sherborne Station is located approximately 5 km southeast of the entrance to the site (as shown in Photograph 2.9 above). Carlton Station is located approximately 2.5 km northwest of the entrance to the site. Both stations have sidings but Carlton has a passing loop which could facilitate the offloading of equipment and components without disrupting other railway traffic.



**Photograph 2.9: Sherborne Station**



**Photograph 2.10: Carlton Station**

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## **SECTION 3: POLICY AND PLANNING CONTEXT**

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### **3.1 INTRODUCTION**

Section 3 provides an overview of the policy and planning environment affecting the proposed PVSEF plant. 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);
- Eastern Cape Provincial Growth and Development Plan (2004-2014);
- The Chris Hani District Municipality Integrated Development Plan (IDP) (2007-2012);
- The Inxuba Yethemba Local Municipality Integrated Development Plan (IDP) (2011-2012).

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

### **3.2 NATIONAL LEVEL ENERGY POLICY**

#### **3.2.1 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).

#### **3.2.2 White Paper on the Energy Policy of the Republic of South Africa**

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

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

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

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

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

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

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

The White Paper also notes that renewable energy applications have specific characteristics that need to be considered. Advantages include:

- Minimal environmental impacts in operation in comparison with traditional supply technologies;
- Generally lower running costs, and high labour intensities.

Disadvantages include:

- Higher capital costs in some cases
- Lower energy densities
- Lower levels of availability, depending on specific conditions, especially with sun and wind based systems

### **3.2.3 White Paper on Renewable Energy**

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

The White Paper notes, that while South Africa is well-endowed with renewable energy resources that have the potential to become sustainable alternatives to fossil fuels, these have thus far remained largely untapped. As signatory to the Kyoto Protocol, 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.

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

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

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

### **3.2.4 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.

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.

Table 3.1 indicates the new capacities of the Policy commitment. The dates shown in Table 3.1 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.

	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
2010	0	0	0	0	0	0	0	0
2011	0	0	0	0	0	0	0	0
2012	0	0	0	0	0	0	0	300
2013	0	0	0	0	0	0	0	300
2014	500 <sup>1</sup>	0	0	0	0	400	0	300
2015	500 <sup>1</sup>	0	0	0	0	400	0	300
2016	0	0	0	0	0	400	100	300
2017	0	0	0	0	0	400	100	300
2018	0	0	0	0	0	400 <sup>4</sup>	100 <sup>4</sup>	300 <sup>4</sup>
2019	250	0	0	237 <sup>2</sup>	0	400 <sup>4</sup>	100 <sup>4</sup>	300 <sup>4</sup>
2020	250	0	0	237 <sup>2</sup>	0	400	100	300
2021	250	0	0	237 <sup>2</sup>	0	400	100	300
2022	250	0	1 143 <sup>2</sup>	0	805	400	100	300
2023	250	1 600	1 183 <sup>2</sup>	0	805	400	100	300
2024	250	1 600	283 <sup>2</sup>	0	0	800	100	300
2025	250	1 600	0	0	805	1 600	100	1 000
2026	1 000	1 600	0	0	0	400	0	500
2027	250	0	0	0	0	1 600	0	500
2028	1 000	1 600	0	474	690	0	0	500
2029	250	1 600	0	237	805	0	0	1 000
2030	1 000	0	0	948	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>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

**Table 3.1: Commitments before next IRP**

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 3.1 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.

## **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: As with wind, 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;
- CSP 2016: The 100 MW of CSP power, planned for 2016, needs firm commitment because of the long lead time of these projects;
- CSP 2017 to 2019: Because of the long lead time for CSP plants, a commitment to the capacity planned for 2017 to 2019 is necessary in the next round of the IRP at the latest. By then, the cost and technical assumptions for CSP plants will also be grounded on more solid empirical data;

## **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).

## **3.3 PROVINCIAL LEVEL POLICY AND PLANNING**

### **3.3.1 Eastern Cape Province Provincial Growth and Development Programme**

The Eastern Cape Provincial Growth and Development Programme (PGDP) 2004-2014 sets out the vision and plan for development for the Eastern Cape until 2014. It highlights, in particular, strategies to fight poverty, promote economic and social development, and create jobs.

The strategy document does not highlight any specific measures to promote the development of renewable energy sources. However, an analysis of energy sources within the province reveals that 23% of the population of the province still rely on paraffin for their energy needs while 25% rely on candles for lighting.



Energy demands and electricity infrastructure rollout forms part of the Strategic Infrastructure Programme of the PGDP. The PGDP states that the, "...economic and logistics infrastructure – energy, roads, rail, ports, and air transport among others – is a necessary condition for economic growth and development."

Section 5 of the PGDP (2004-2014) identifies six strategic objective areas of the PGDP. Of these the infrastructure programme is of relevance to the study. The report notes that development of infrastructure, especially in the former homelands, is a necessary condition to eradicate poverty through:

- The elimination of social backlogs in access roads, schools and clinics and water and sanitation;
- To leverage economic growth through access roads and improving the road, rail and air networks of the Province.

Infrastructure development, in turn, will have strong growth promotion effects on the agriculture, manufacturing and tourism sectors by improving market access and by "crowding in" private investment. Poverty alleviation should also be promoted through labour-intensive and community based construction methods.

The PGDP indicates that the programmes have been selected for their potential in leveraging significant resources, creating a large multiplier effect, and providing a foundation for accelerated economic growth. Of specific relevance is the Strategic Infrastructure Programme. This programme indicates that enabling economic and logistics infrastructure – energy, roads, rail, ports, and air transport among others – is a necessary condition for economic growth and development. Specific reference is therefore made to energy infrastructure.

The Strategic Infrastructure Programme also seeks to consolidate and build on this coastal advantage through the provision of world-class infrastructure and logistics capability at the Coega and East London IDZs, and improving connectivity and linkages with major industrial centres such as Johannesburg.

The high-level objectives of the Strategic Infrastructure Programme include consolidating and building upon the strengths of the Province's globally-competitive industrial sector through the development of world-class infrastructure and logistics capability in the East London and Coega IDZs. A reliable energy supply will be critical to achieving these objectives. The proposed PSEF will contribute to the future energy requirements of the Eastern Cape, and its proximity to the Coega IDZs will also benefit these key initiatives.

### **3.4 DISTRICT LEVEL PLANNING AND SPATIAL POLICY CONTEXT**

#### **3.4.1 Chris Hani District Municipality Integrated Development Plan 2009-2010**

The Chris Hani District Municipality Integrated Development Plan (IDP) (2009-2010) is based on the requirements and guidance of the Municipal Systems Act (Act No. 32 of 2000) which identifies 5 broad strategic priority areas for consideration during the IDP process. These broad strategic priority areas are as follows:

- Infrastructure and Services;
- Social and Economic Development;
- Institutional Transformation;
- Democracy and Governance; and,
- Financial Management/Viability.

More specifically, the 2009-2010 IDP forms the basis for the District to achieve the following:

- Support Government efforts to put the people at the centre of development, not merely as beneficiaries, but as drivers of transformation;
- Move faster and further in providing a better life for all;
- Strive to halve unemployment and poverty by the end of 2014;
- Create job opportunities and fight poverty through infrastructure development and service delivery, procurement and support for SMME's and Broad Based Black Economic Development;
- Speed up the delivery of free basic services;
- Work with National and Provincial Government to improve service delivery and access to basic services;
- Ensure that communities have access to clean water by the end of 2010;
- **Ensure that communities have access to electricity by the end of 2014;**
- Ensure that communities have access to decent sanitation by the end of 2010;
- Ensure that communities have access to decent housing by the end of 2010;
- Utilise distributed land for development and agricultural purposes;
- Provide the skills required for the District's economic development and growth;
- Provide infrastructure to facilitate economic growth and development that will increase capacity to provide basic services and contribute to a safe and healthy environment;
- Ensure community and public participation to allow citizens to identify the problems that their community face and partner in providing solutions;
- Build sustainable human settlements;
- Ensure that councillors are responsive, accountable and effective and that everybody is involved in local government understands and honours the duty to respect and serve the people.

The guidance of the strategic priorities forms the framework for the District analysis of the status quo across numerous sectors within the District. The District analysis, in turn, informs the development Key Performance Areas (KPA) for the municipality. The IDP development KPAs highlighted in the Chris Hani IDP include:

- **KPA 1:** *Service Delivery and Infrastructure - Water and Sanitation, Roads, Housing, Municipal Public Works, Health (Primary& Public), Municipal Health, Environmental Management, Waste Management , Disaster Management, Fire fighting, Community Facilities, Safety and Security, Education, Social and Community needs development, Town and Regional Planning and HIV/AIDS;*
- **KPA 2:** *Institutional Development and Transformation - Powers and Functions, Organisational Development, Employment Equity (EEP), HIV/Aids Plan and Special Programmes;*
- **KPA 3:** *Good Governance - Public participation, Municipal Planning (IDP, PMS, SDF etc), IGR, Anti-Corruption, Customer Care Relations & Communication, Internal audit, Archiving, Meeting minutes, Information and Communication Technology (ICT), HIV/AIDS and Contract Management;*

- **KPA 4:** *Financial Responsibility - lean Audit Statements, Budget & Expenditure, Reporting, Supply Chain Management, Risk Management Revenue & Billing and ICT; and*
- **KPA 5:** *Local Economic Development (LED) - Agriculture, Forestry, Tourism, Manufacturing and Construction and Trade.*

The IDP priorities and associated strategy objectives that are relevant to the proposed PSEF include:

- **KPA 1:** *Service Delivery and Infrastructure -*
  - Key objective(s): i) "To create and maintain access road infrastructure and network and to create and maintain bridges and related infrastructure"; ii) "Introduce alternative technologies to contribute to sound environmental principals (support investigations into alternative technologies)"; and
- **KPA 5:** *Local Economic Development -*
  - Key objective(s): i) "To grow district economy and contribute to job creation and fight against poverty and unemployment"; ii) "To empower and integrate marginalized groups into the mainstream of the local economy".

The District IDP notes that the irregular and insufficient supply of electricity throughout the district is a hindrance to local economic and SMME development. Therefore, while it is not explicitly stated as an IDP priority it is, by association with Priority 1 above, a vital part of the District's strategy objectives and planning.

### **3.5 MUNICIPAL LEVEL PLANNING AND SPATIAL POLICY CONTEXT**

#### **3.5.1 Inxuba Yethemba Integrated Development Plan (2010)**

The development strategies outlined in the Inxuba Yethemba LM Integrated Development Plan (IDP) (2010) are informed by the Local Government 5 year strategic agenda which involve the following:

- Service delivery and basic infrastructure;
- Local economic development;
- Financial viability;
- Institutional development and municipal transformation;
- Good governance and public participation.

The objectives and strategies contained within the IDP (2010) are associated with the 5 key development strategy priorities listed above. These priorities address the outcome of an analysis of the status quo across numerous sectors within the IYLM and, in turn, inform the development objectives and strategies for the municipality.

These priorities aim to utilize existing economic strengths and opportunities by transferring these into workable programmes and projects. These programmes and projects tend to reduce the current threats, and strengthen the weaknesses in the local economic environment. The IDP priorities that are relevant to the proposed Solar Photovoltaic Energy Facility include:

#### **Priority 1: Basic Infrastructure and Services**

*Key Objective relating to the proposed project: Ensure that all communities receive adequate and uninterrupted supply of electricity by applying for funding for the*

*electrification of newly built houses and taking appropriate measures to reduce power failures.*

### **Priority 3: Economic Development**

*Key Objective relating to the proposed project: Ensure development is in line with Local Economic Development Strategy through, amongst other measures, upgrading infrastructure and services to both the industrial and central business areas and encouraging business and investment in the LM through policies and by-laws.*

The LM IDP does not make specific mention of renewable/alternative energy in its strategy. However, it does list the responsible utilisation of renewable resources as a guiding principle.

### **3.6 INTERNATIONAL EXPERIENCE WITH SOLAR ENERGY PLANTS**

The proposed Middleburg facility is a PVSEF as opposed to a Concentrating Solar Power (CSP) plant. In this regard the majority of the international experience is based on CSPs as opposed to PVSEFs. 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 Northern Cape Province. PVSEFs on the other hand, such as the proposed Schmidtsdrift PVSEF plant, on the other hand, do not require cooling water and as such are more suited to areas where water is a scarce resource.

In terms of visual impacts, the parabolic troughs and the power tower, where the solar energy from the solar reflectors is concentrated, are likely to have a higher visual impact than the solar panels associated with PVSEF plants.

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

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### **4.1 INTRODUCTION**

Section 4 identifies the key social issues identified during the SIA study. The identification of social issues was based on:

- Review of project related information, including other specialist studies;
- Interviews with key interested and affected parties;
- Experience of the authors of the area and the local conditions;
- Experience with other PVSEFs in South Africa.

In identifying the key issues the following assumption is made:

- The area identified for the proposed PVSEF meets the technical criteria required for such facilities.

### **4.2 IDENTIFICATION OF KEY SOCIAL ISSUES**

The key social issues identified during the SIA can be divided into:

- The policy and planning related issues and
- Local, site-specific issues.

The local site-specific issues can in turn be divided into construction and operational related issues. These issues are discussed and assessed below. The potential impacts associated with the associated infrastructure (access road and power line routes) are also assessed.

### **4.3 POLICY AND PLANNING ISSUES**

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);
- Eastern Cape Provincial Growth and Development Plan (2004-2014);

- The Chris Hani District Municipality Integrated Development Plan (IDP) (2007-2012);
- The Inxuba Yethemba Local Municipality Integrated Development Plan (IDP) (2011-2012).

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 the ECPGDP states that "...economic and logistics infrastructure – energy, roads, rail, ports, and air transport among others – is a necessary condition for economic growth and development." Specific reference is therefore made to energy infrastructure. At a district level the CHDM IDP identifies the irregular and insufficient supply of electricity as a constraint to local economic and SMME development. Therefore, while the IDP does not explicitly make reference to renewable energy, the provision of a reliable energy supply is identified a key requirement. The IYLM IDP does not make specific reference to renewable/alternative energy in its strategy. However, it does list the responsible utilisation of renewable resources as a guiding principle.

Based on this is it reasonable to assume that the establishment of well-located PVSEF's are supported.

#### **4.4 SOCIAL IMPACTS ASSOCIATED WITH THE CONSTRUCTION PHASE**

The key social issues associated with the construction phase include:

##### **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;
- Impact of heavy vehicles, including damage to roads, safety, noise and dust;
- Potential loss of grazing land associated with construction-related activities.

#### **4.4.1 Creation of employment and business opportunities**

Based on information from ACED's PVSEF near De Aar in the Northern Cape Province, the capital expenditure associated with the construction of two 75 MW PVSEFs (150 MW in total) will be in the region of R 4 billion (current value). The construction phase is expected to extend over a period of 24-36 months and create approximately 200 employment opportunities at peak construction. Approximately 20% (40) of the employment opportunities will be available to skilled personnel (engineers, electricians, mechanics, skilled machine drivers, management and supervisory), 20% (40) to semi-skilled personnel (drivers, equipment operators), and ~ 60% (12) to low skilled personnel (construction labourers, security staff). The work associated with the construction phase will be undertaken by contractors and will include the establishment of the PVSEF plant and the associated components, including, access roads, substation, services and power line.

The majority of the employment opportunities, specifically the low and semi-skilled opportunities which make up ~ 160 jobs, are likely to be available to local residents in the area, specifically residents from Middleburg. 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 majority of contractors tend to use their own staff and this may limit the potential for direct employment opportunities for locals during the construction phase. In the absence of specific commitments from the developer to maximise local employment targets the potential for local employment opportunities for members from the Middleburg community may be limited. In addition, the low education and skills levels in the area may also hamper potential opportunities for local communities.

The injection of income into the area in the form of rental for accommodation and wages will create opportunities for local businesses in Middleburg, Colesburg and Cradock. 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 (~ 24-36 months).

In terms of business opportunities for local companies, expenditure during the construction phase will create business opportunities for the regional and local economy. However, due to the technical nature of the project and high import content associated with PVSEFs, the opportunities for the local economy and the towns of Middleburg, Colesburg and Cradock are likely to be limited. However, opportunities are likely to exist for local contractors and engineering companies in Port Elizabeth and Bloemfontein. Implementing the enhancement measures listed below can enhance these opportunities.

The implementation of the proposed enhancement measures listed below would also enable the establishment of the proposed PVSEF plant to support co-operation between the public and private sectors in order for the economic development potential of the Eastern Cape to be realised. In this regard the ECPGDS highlights the importance of enterprise development, and notes that the current levels of

private sector development and investment in the Eastern Cape are low. The proposed PVSEF plant therefore has the potential to create opportunities to promote private sector investment and the development of SMMEs in the Eastern Cape Province.

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

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

<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 (1) (Rated as 1 due to potential opportunities for local communities and businesses)	Local – Regional (3) (Rated as 3 due to potential opportunities for local communities and businesses)
<b>Duration</b>	Short Term (2)	Short Term (2)
<b>Magnitude</b>	Low (4)	Moderate (6)
<b>Probability</b>	Highly probable (4)	Highly probable (4)
<b>Significance</b>	Low (28)	Medium (44)
<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. However, due to relatively small number of local employment opportunities this benefit is likely to be limited.		
<b>Residual impacts:</b> Improved pool of skills and experience in the local area. However, due to relatively small number of local employment opportunities this benefit is likely to be limited.		

**Assessment of No-Go option**

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



### **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, ACED 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 ACED should meet with representatives from the IYLM 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 IYLM should be informed of the final decision regarding the project and the potential job opportunities for locals and the employment procedures that ACED 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**

- ACED should identify local companies, specifically BEE companies, that 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, ACED should assist local BEE companies to complete and submit the required tender forms and associated information.
- The IYLM 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.

#### **4.4.2 Presence of construction workers in the area**

In terms of affected farmsteads, there are a relatively small number of farmsteads that will be affected. Based on the findings of the site visit the closest farmstead to the site is the Carlton Heights farmstead and guesthouse. However, there are a number of potentially vulnerable farming activities, such as livestock farming. The potential threat to farming activities is discussed below.

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 the local community and farm workers. In this regard the most significant negative impact is associated with the disruption of existing family structures and social networks. This risk is linked to the potential behaviour 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).

ACED has indicated that they are committed to implementing a local employment policy, specifically for the low and semi-skilled employment opportunities associated with the construction phase. In addition, ACED has also indicated that no construction personnel, with the exception of security personnel, will be accommodated on the site during the construction phase. Middleburg is located ~ 20 km from the site. Workers can therefore be transported to and from the site on a daily basis. The potential risk to farm workers will therefore be low.

Employing members from the local community to fill the low-skilled job categories will also reduce the risk posed to members of the local community in Middleburg. 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. However, due to the potential mismatch of skills and low education levels, the potential employment opportunities for community members from Middelburg and the towns of Colesburg and Cradock may be low.

In terms of significance, the potential risk posed by construction workers to local farm workers and the members of the Middleburg community is rated as low. However, for individual members of the community who are impacted by the activities associated with construction workers, such as an un-planned pregnancy, the impact would be high.

**Table 4.2: Assessment of impact of construction workers 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 (3) and (5) (Rated as 3 in terms of the impact on the community and 5 for individuals)	Local (2) and (5) (Rated as 2 in terms of the impact on the community and 5 for individuals)
<b>Duration</b>	Short term for community as a whole (2) Long term-permanent for individuals who may be affected by STD's etc. (5)	Short term for community as a whole (2) Long term-permanent for individuals who may be affected by STD's etc. (5)
<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)	Low for community as a whole (4) 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>	Low for the community as a whole (27) High for specific individuals who may be affected by STD's etc. (60)	Low for the community as a whole (24) High for specific individuals who may be affected by STD's etc. (60)
<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 it maintains the current status quo. 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 aspects that should be covered include:

- Where possible, ACED will make it a requirement for contractors to implement a 'locals first' policy for construction jobs, specifically semi and low-skilled job categories. This will reduce the potential impact that this category of worker could have on local family and social networks in Middleburg and other surrounding towns;
- ACED, in consultation with the IYLM and local farmers, should consider the need for the establishment of a Monitoring Forum (MF) for the construction phase. The role of the MF would be to monitor the construction phase and the implementation of the recommended mitigation measures. The MF should also be briefed on the potential risks to the local community associated with construction workers;
- ACED and the contractor should, in consultation with representatives from the MF, develop a Code of Conduct for the construction phase. The code should identify what types of behaviour and activities by construction workers are not permitted. Construction workers that breach the code of good conduct should be dismissed. All dismissals must comply with the South African labour legislation;
- ACED 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 on a daily basis;
- The contractor should make the necessary arrangements for allowing workers from outside the area to return home over weekends. This would reduce the risk posed by construction workers 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 overnight on the site. This will make it possible to manage the potential impacts effectively.

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

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. 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.

However, the potential for an influx of job seekers to the area is likely to be low. This is due to the relatively short duration of the construction phase and the isolated location of the site. The likelihood and significance of this impact is therefore rated as low. In addition, jobs seekers who do come to the area in search of work during the construction phase are unlikely to remain in the area if they fail to find work. This is due to the limited economic opportunities in Middleburg and the surrounding towns.

**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 (2)	Local (2)
<b>Duration</b>	Short term (2)	Short term (2)
<b>Magnitude</b>	Low (4)	Minor (2)
<b>Probability</b>	Probable (3)	Probable (3)
<b>Significance</b>	Low (24)	Low (18)
<b>Status</b>	Negative	Negative
<b>Reversibility</b>	Yes	Yes
<b>Irreplaceable loss of resources?</b>	No	
<b>Can impact be mitigated?</b>	Yes, by employing local residents	
<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, the number of job seekers that are likely to travel to the area is likely to be low. In addition:

- ACED, in consultation with the IYLM, should implement a local employment policy for all low and semi-skilled jobs;
- Implement a policy that no employment will be available at the gate;
- ACED, in consultation with the IYLM, should investigate the need to establish a MF (see above) to monitor and identify any potential problems that may arise due to the influx of job seekers to the area.

#### 4.4.4 Increased risk of stock theft, poaching and damage to farm infrastructure

The presence of construction workers on the site increases the potential risk of stock theft and poaching. The movement of construction workers on and off the site also poses a potential threat to farm infrastructure, such as fences and gates, which may be damaged. Stock and game losses may also result from gates being left open and/or fences being damaged. In terms of risks, the proposed PVSEF (Solar Park 1 and 2) is located on one farm (Beskuitsfontein) which is owned by the Erasmus family. The Erasmus family have owned the farm since the 1960's and farm sheep and cattle. Mr Erasmus indicated that he had a lease agreement with ACED and was not concerned about the potential impacts associated with the construction phase. Mrs Moore, the owner of the adjacent farm, Wolwekop, also indicated that she was not concerned about the proposed project.

**Table 4.4: 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) (Rated as 3 due to potential severity of impact on local farmers)	Local (2)
<b>Duration</b>	Short Term (2)	Short Term (2)
<b>Magnitude</b>	Moderate (6) (Due to reliance on agriculture and livestock for maintaining livelihoods)	Low (4)
<b>Probability</b>	Probable (3)	Probable (3)
<b>Significance</b>	Medium (33)	Low (24)
<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**

The mitigation measures that can be considered to address the potential impact on livestock and farm infrastructure include:

- ACED should enter into an agreement with the affected landowners whereby the company will compensate farmers for any stock losses and/or damage to farm infrastructure that can be linked to construction workers. The agreement should also cover losses and costs associated with fires caused by construction workers or construction related activities (see below);
- ACED should investigate the option of establishing a MF (see above) that includes local farmers and developing a Code of Conduct for construction workers. Should such a MF be required it should be established prior to commencement of the construction phase. The Code of Conduct should be signed by ACED and the contractors before the contractors move onto site;
- 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 ACED should 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, poaching and trespassing on adjacent farms;
- Contractors appointed by ACED should ensure that construction workers who are found guilty of stealing livestock and or poaching 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 limited to security personnel.

#### **4.4.5 Increased risk of veld fires**

The issue of veld fires is an issue given that the dominant land use in the area is livestock farming. Any impact on grazing, such as veld fires, will therefore impact on the livelihoods of the affected farmers. The presence of construction workers and construction-related activities on the site poses an increased risk of veld fires that in turn pose a threat to the livestock, wildlife, and farmsteads in the area. In the process, farm infrastructure may also be damaged or destroyed and human lives threatened.

- The potential risk of veld fires is highest during the dry, winter months;
- The risk of fire related damage is exacerbated by the distance to fire-fighting vehicles located in the nearest town of Middleburg.

**Table 4.5: Assessment of impact of increased risk of veld fires**

<b>Nature:</b> Potential loss of livestock, crops and houses, damage to farm infrastructure and threat to human life associated with increased incidence of veld fires		
	<b>Without Mitigation</b>	<b>With Mitigation</b>
<b>Extent</b>	Local (4) (Rated as 4 due to potential severity of impact on local farmers)	Local (2) (Rated as 2 due to potential severity of impact on local farmers)
<b>Duration</b>	Short Term (2)	Short Term (2)
<b>Magnitude</b>	High due to reliance on livestock for maintaining livelihoods (10)	Low (4)
<b>Probability</b>	Highly Probable (4)	Probable (3)
<b>Significance</b>	High (64)	Low (24)
<b>Status</b>	Negative	Negative
<b>Reversibility</b>	Yes, compensation paid for stock and crop losses etc.	
<b>Irreplaceable loss of resources?</b>	No	No
<b>Can impact be mitigated?</b>	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**

As indicated above, ACED should enter into an agreement with the affected landowners whereby the company will compensate for damages. This includes losses associated veld fires. In addition, the potential increased risk of veld fires can be effectively mitigated. The detailed mitigation measures are outlined in the EMP for the construction and operation phases. The aspects that should be covered include:

- A firebreak should be established around the perimeter of the site prior to the commencement of the construction phase. The fire break should be maintained throughout the lifespan of the site. This would also protect the facility from veld fires in the area;
- The contractor should contact all of the adjacent farm owners prior to the commencement of the construction phase and ensure that he/she has the contact numbers so that they can be contacted in the event of a fire;
- The contractor to ensure that open fires on the site for cooking or heating are not allowed except in designated areas;
- The contractor should ensure that construction related activities that pose a potential fire risk, such as welding, are properly managed and are confined to areas where the risk of fires has been reduced. Measures to reduce the risk of



fires include clearing working areas and avoiding working in high wind conditions when the risk of fires is greater. In this regard special care should be taken during the high risk dry, winter months;

- The contractor should provide adequate fire fighting equipment on-site;
- The contractor should provide fire-fighting training to selected construction staff;
- In the event of a fire being caused by construction workers and or construction activities, the responsible contractor must compensate farmers for damage caused to their farms. The contractor should also compensate the fire fighting costs borne by farmers and local authorities.

In addition the local landowners and contractor (while on site) should ensure that they are members of the local fire protection agency.

#### 4.4.6 Impact of construction vehicles

The movement of construction vehicles during the construction phase has the potential to damage local gravel roads that provide access to the site. The movement of construction vehicles can also result in dust and associated safety impacts for other road users. Access to the site will be from the N9. The impacts associated with the movement of construction vehicles during the construction phase can however effectively mitigated. The recommended mitigation measures are listed below.

**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 (2)
<b>Duration</b>	Short Term (2)	Short Term (2)
<b>Magnitude</b>	Low (4)	Minor (2)
<b>Probability</b>	Probable (3)	Probable (3)
<b>Significance</b>	Low (24)	Low (15)
<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 impact on other road users 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**

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

- The movement of construction vehicles along the local gravel access road of the N9, specifically heavy construction vehicles, should be confined to the period of 07h00 and 18h00. This is aimed at reducing the potential dust and safety impacts for other road users;
- All drivers employed during the construction phase should be briefed and notified of the potential safety risks posed by construction vehicles to other road users, specifically road users along the gravel access road off the N9;
- 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;
- The contractor should ensure that appropriate dust suppression measures are 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;
- The contractor should ensure that all vehicles must be road-worthy and regularly serviced, and drivers must be qualified and made aware of the potential road safety issues and need for strict speed limits.

In addition, it is recommended that ACED investigate the option of using rail to transport materials and equipment from Port Elizabeth to the site.

#### **4.4.7 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. The total area allocated to the proposed PVSEF plant will be limited to ~ 700 ha (i.e. ~350 hectares for one 75MW plant). In addition, ACED have entered into a lease agreement with Mr Erasmus for the land that will be taken up by the proposed PVSEF. The loss of productive farmland will therefore be offset by the income from the lease agreement. Mr Erasmus has also requested that the PV panels should be placed at a height that would enable sheep to continue grazing on the site. 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 plant 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 (3)	Local (1)
<b>Duration</b>	Long term-permanent if disturbed areas are not effectively rehabilitated (5)	Short term if damaged areas are rehabilitated (2)
<b>Magnitude</b>	Moderate, due to importance of farming in terms of local livelihoods (4)	Minor (2)
<b>Probability</b>	Definite (5)	Highly Probable (4)
<b>Significance</b>	High (60)	Low (20)
<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>	No, disturbed areas can be rehabilitated	No, disturbed areas can be rehabilitated
<b>Can impact be mitigated?</b>	Yes, however, loss of farmland cannot be avoided for the duration of the project	Yes, however, loss of farmland cannot be avoided for the duration of the project
<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**

As indicated above, ACED has entered into a lease agreement with the landowner which will compensate for the loss of income from farming. The potential impacts associated with damage to and loss of farmland can also 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 implementation of the Rehabilitation Programme should be monitored by the ECO.

#### **4.5 SOCIAL IMPACTS ASSOCIATED WITH THE 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;
- Benefits associated with the establishment of a local community trust;
- The establishment of renewable energy infrastructure.

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

- The visual impacts and associated impact on sense of place;
- Potential impact on tourism.

##### **4.5.1 Creation of employment and business opportunities**

The operational lifespan of the proposed PVSEF plant is estimated at ~ 20 years. However, the life of the plant can be extended by replacing old components and/or installing new technology. The PVSEF plant will be operational 7 days a week and activities consist largely of cleaning and maintaining the tracking units and electrical equipment.

Based on information from ACED De Aar PVSEF the proposed Middleburg PVSEF will create ~ 50 full time employment opportunities for the 20 year life of the project. Of this total approximately 80% (40) will be low and medium-skilled and 20% (10) high skilled positions. The majority of the beneficiaries are therefore likely to be historically disadvantaged (HD) members of the community from Middleburg, Colesburg and Cradock. Over time 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 IYLM IDP.

The Municipal Manager of the CHDM, Ms Noxolo indicated that proposed establishment of renewable energy projects in the area, such as PVSEFs, was supported as long as a recognised and acceptable EIA and consultation process were undertaken.

**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</b>
<b>Extent</b>	Local and Regional (2)	Local and Regional (4)
<b>Duration</b>	Long term (4)	Long term (4)
<b>Magnitude</b>	Low (4)	Moderate (6)
<b>Probability</b>	Probable (3)	Highly Probable (4)
<b>Significance</b>	Medium (30)	Medium (56)
<b>Status</b>	Positive	Positive
<b>Reversibility</b>	N/A	
<b>Irreplaceable loss of resources?</b>	No	
<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:

- ACED 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.

#### **4.5.2 Benefits associated with the establishment of a community trust**

In terms of the Request for Proposal document prepared by the Department of Energy all bidders for operating licences for renewable energy projects must demonstrate how the proposed development will benefit the local community. This can be achieved by establishing a community trust which is funded by revenue generated from the sale for energy. ACED has indicated that they are committed to establishment of a community trust.

Community trusts provide an opportunity to generate a steady revenue stream that is guaranteed for a 20 year period. This revenue can be used to fund development initiatives in the area and support the local community. The long term duration of the revenue stream also allows local municipalities and communities to undertake long term planning for the area. The revenue from the proposed PVSEF plant can be used to support a number of social and economic initiatives in the area, including:

- Education;
- Farming, including irrigation projects;
- Training and skills development;
- Support for SMME's.

In addition, the establishment of a PVSEF plant does not significantly impact on the other land uses that underpin the local economic activities in the area. The loss of this relatively small area will not impact on the current and future livestock farming activities.

Experience has however also shown that community trust can be mismanaged. This issue will need to be addressed in order to maximise the potential benefits associated with the establishment of a community trust.

**Table 4.9: Assessment of benefits associated with establishment of a community trust**

<b>Nature:</b> Establishment of a community trust funded by revenue generated from the sale of energy. The revenue can be used to fund local community development		
	<b>Without Mitigation</b>	<b>With Enhancement<sup>5</sup></b>
<b>Extent</b>	Local (2)	Local and Regional (4)
<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 (70)
<b>Status</b>	Positive	Positive
<b>Reversibility</b>	N/A	
<b>Irreplaceable loss of resources?</b>	No	
<b>Can impact be enhanced?</b>	Yes	
<b>Enhancement:</b> See below		
<b>Cumulative impacts:</b> Promotion of social and economic development and improvement in the overall well-being of the community		
<b>Residual impacts:</b> See cumulative impacts		

<sup>5</sup> Enhancement assumes effective management of the community trust

### Assessment of No-Go option

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

### Recommended enhancement measures

In order to maximise the benefits and minimise the potential for corruption and misappropriation of funds the following measures should be implemented:

- Clear criteria for identifying and funding community projects and initiatives in the area should be identified. The criteria should be aimed at maximising the benefits for the community as a whole and not individuals within the community;
- Strict financial management controls, including annual audits, should be instituted to manage the funds generated for the community trust from the PVSEF plant.

### 4.5.3 Development of clean, renewable energy infrastructure

South Africa currently relies on coal-powered energy to meet more than 90% of its energy needs. The majority of the coal used to generate energy in South Africa is low grade coal with 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 of carbon emissions.

As indicated above, the promotion of renewable energy sources is supported at national and provincial levels. However, the overall contribution of the proposed Middleburg PVSEF plant to South Africa's total energy requirements will be relatively small (150 MW). The potential contribution of the proposed PVSEF plant should therefore be regarded as valuable, but should not be overestimated.

**Table 4.10: Development of clean, renewable energy infrastructure**

<b>Nature:</b> Development of infrastructure to generate clean, renewable energy		
	<b>Without Mitigation</b>	<b>With Enhancement</b>
<b>Extent</b>	Local, Regional and National (3)	Local, Regional and National (3)
<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 (44)	Medium (44)
<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>		

Potential contribution to establishing an economically viable commercial renewables generation sector in the Western Cape and South Africa.

**Residual impacts:** 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 ACED should:

- Use the project to promote and increase the contribution of renewable energy to the national energy supply;
- 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;

#### **4.5.4 Visual impact and impact on sense of place**

Based on the site visit the potential visual impacts associated with the proposed PVSEF plant are likely to be low. Mrs Erasmus, who runs the Carlton Heights Guesthouse, indicated that the proposed facility was not likely to have an impact on the area. Mrs Moore who runs the Sherborne Guesthouse on the adjacent farm of Wolwekop also indicated that she was not concerned about the proposed project. Both guesthouse owners indicated that the proposed PVSEF was likely to benefit the guesthouses. Mr Erasmus indicated that the site would be visible from the N9. However, the site would be screened from Wolwekop by a low hill that separates the two farms.

The findings of the VIA undertaken by MetroGIS (February, 2012) are summarised below:

#### **Potential visual impact on sensitive visual receptors in close proximity to the proposed SEF**

Sensitive visual receptors in close proximity to the proposed SEF (i.e. **within a 4km radius**) include residents of homesteads and users of the N9 and N10 running through sites and to the west. The anticipated visual impact resulting from the proposed SEF and ancillary infrastructure is likely to be of **high** visual impact within a 4km radius of the facility and **very high** visual impact where the N9/N10 road traverses the development site, as well as the Vlakfontein homestead located immediately adjacent to the site.

#### **Potential visual impact on sensitive visual receptors within the region**

Sensitive visual receptors within the region (i.e. **beyond the 4km radius**) include users of limited sections of the N10, secondary roads and residents of homesteads and settlements. The visual impact for the facility is likely to occur primarily as a result of primary infrastructure (i.e. the PV panels), but ancillary infrastructure may also be a factor. The anticipated visual impact resulting from the proposed SEF and ancillary infrastructure is likely to be of **moderate** significance for both sites, but may be mitigated to **low**.



**Potential visual impact of the proposed facility on the visual character of the landscape and the sense of place of the region and within the visual catchment**

A visual impact on the sense of place is one that alters the visual landscape to such an extent that the user experiences the environment differently, and more specifically, in a less appealing or less positive light. The findings of the VIA indicate that the impact is likely to be of **high** significance (mitigated to **Moderate**) within the catchment basin and of **low** significance within the region.

The VIA concludes by noting that despite the visual impact where the N9/N10 road traverses the development site and Vlakkfontein homestead being high, these are not considered to be fatal flaws from a visual perspective. The main considerations in this regard are the relatively limited extent of visual exposure and the relatively low occurrence of potentially sensitive visual receptors. The VIA therefore recommends that the development of the facility as proposed be supported subject to the implementation of the recommended mitigation measures and management plan contained in the report. This finding is supported by the findings of the SIA.

**Table 4.11: Visual impact and impact on sense of place**

<b>Nature:</b> Visual impact associated with the proposed PVSEF plant and the potential impact on the areas rural sense of place.		
	<b>Without Mitigation</b>	<b>With Mitigation</b>
<b>Extent</b>	Local (2)	Local (2)
<b>Duration</b>	Long term (4)	Long term (4)
<b>Magnitude</b>	Low (4)	Low (4)
<b>Probability</b>	Probable (3)	Probable (3)
<b>Significance</b>	Medium (30)	Medium (30)
<b>Status</b>	Negative	Negative
<b>Reversibility</b>	Yes, PVSEF plant 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.

#### 4.5.5 Impact on tourism

The N9 is an important access route linking the Eastern Cape with the inland provinces in South Africa. The N9 can therefore also be regarded as an important tourist route. Based on the site visit the proposed PVSEF will be visible from sections of the N9. The findings of the VIA in this regard indicate the site will be visible from the N9. However, the VIA indicates that this impact is not considered to be a fatal flaw from a visual perspective.

The overall tourism potential of the area is also low. In addition, as indicated above, the owners of the two guesthouses in the immediate vicinity of the site (Mrs Erasmus, Carlton Heights Guesthouse and Mrs Moore, Sherborne Guesthouse) both indicated that the proposed facility was not likely to have an impact on tourism in the area. The potential impact on tourism is therefore assessed to be of low significance with and without mitigation.

**Table 4.12: Impact on tourism**

<b>Nature:</b> Potential impact of the PVSEF plant on local tourism		
	<b>Without Mitigation</b>	<b>With Enhancement / 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 enhanced?</b>	Yes	
<b>Enhancement:</b> See below		
<b>Cumulative impacts:</b> Potential negative and or positive impact on tourism in the IYLM		
<b>Residual impacts:</b> See cumulative impacts		

#### Assessment of No-Go option

The No-Development option would result in the current status quo being maintained.

#### Recommended enhancement measures

The recommendations contained in the VIA should be implemented;

### 4.6 ASSESSMENT POWER LINE OPTIONS

The proposed facility includes the establishment of an overhead power line linking the facility to the existing Eskom grid. The social impact associated with the power

line will be low due to the existence of the existing Eskom power line in the area and the proximity of the Ludlow substation to the site.

**Table 4.13: 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.

#### 4.7 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 therefore 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 negative social cost.

The No-Development option would also result in a loss in employment opportunities associated with both the construction and operational phase. In addition, the revenue generated by the proposed PVSEF plant for the community trust would be forfeited. As indicated above the community trust can be used to support a number of social and economic initiatives in the area. These benefits would be forgone if the proposed PVSEF plant is not developed. Given the limited economic opportunities in the area this would represent a significant negative social cost.

**Table 4.14: Assessment of no-development option**

<b>Nature:</b> The no-development option would result in the lost opportunity for South Africa to supplement its energy needs with clean, renewable energy. The no development option would also result in a lost opportunity to create a community trust funded by revenue from the sale of energy from the proposed PVSEF		
	<b>Without Mitigation</b>	<b>With Enhancement</b>
<b>Extent</b>	Local-Regional (3)	Local-Regional (4)
<b>Duration</b>	Long term (4)	Long term (4)
<b>Magnitude</b>	Low (4)	Moderate (6)
<b>Probability</b>	Highly Probable (4)	Highly Probable (4)
<b>Significance</b>	Medium (44)	Medium (56)
<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.

## **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 PVSEF plants 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 PVSEF plants.

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.

However, based on the findings of the site visit, the proposed facility is not likely to have a significant cumulative impact on the areas sense of place and character. This is largely due to the existence of the existing power lines in the area and the relatively small scale of the project. In addition, there appear to be no other large PVSEF plants located in close proximity of the proposed Middleburg PVSEF plant. The significance of this issue is therefore rated as low negative. However, given the importance of the N9, the potential for sequential visibility impacts (e.g. the effect of seeing two or more wind farms (solar facilities) along a single journey do exist. This is an issue that the national and provincial environmental authorities need to take into account when considering the location of renewable energy facilities, specifically facilities located near national roads and important tourist routes.

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

<b>Nature:</b> Visual impacts associated with the establishment of more than one PVSEF plant 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.

## **4.9 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 number of people affected (~ 50), the decommissioning of the facility does have the potential to have a negative social impact on the local community. However, 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:

- ACED 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;
- ACED 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 20 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.

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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 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 renewable energy projects in South Africa

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

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

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

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

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

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);
- Eastern Cape Provincial Growth and Development Plan (2004-2014);
- The Chris Hani District Municipality Integrated Development Plan (IDP) (2007-2012);
- The Inxuba Yethemba Local Municipality Integrated Development Plan (IDP) (2011-2012).

The findings of the review indicated that renewable energy, including solar energy, is strongly supported at a national level. The findings of the review indicated that solar energy was strongly supported at a national level. Although the ECPGDP, CHDM IDP



and IYLM IDP do not make specific reference to renewable energy, they all highlight the importance of energy infrastructure and a reliable supply of energy for economic development. Based on this it is reasonable to assume that the establishment of well-located PVSEF's are supported.

### **5.2.2 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 capital expenditure associated with the construction of a 150 MW PVSEF (Solar Park 1 and 2) will be in the region of R 4 billion (current value). The construction phase is expected to extend over a period of 24-36 months and create approximately 200 employment opportunities at peak construction. Approximately 20% (40) of the employment opportunities will be available to skilled personnel (engineers, electricians, mechanics, skilled machine drivers, management and supervisory), 20% (40) to semi-skilled personnel (drivers, equipment operators), and ~ 60% (120) to low skilled personnel (construction labourers, security staff).

The majority of the employment opportunities, specifically the low and semi-skilled opportunities which make up ~ 160 jobs, are likely to be available to local residents in the area, specifically residents from Middleburg. 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. In the absence of specific commitments from the developer to employ locals the potential for job creation for members from the local community may be limited.

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 (~24-36 months).

#### **Potential negative impacts**

- Impacts associated with the presence of construction workers on site
- Influx of job seekers to the area;
- 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.

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 (i.e. contract HIV/ AIDS) was assessed to be of 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>	Low (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) High (Negative impact of individuals)	Low (Negative impact for community as a whole) High (Negative impact of individuals)
<b>Influx of job seekers</b>	Low	Low
<b>Risk of stock theft, poaching and damage to farm infrastructure</b>	Medium (Negative impact)	Low (Negative impact)
<b>Risk of veld fires</b>	High (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>	High (Negative impact)	Low (Negative impact)

### 5.2.3 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;
- Benefits associated with the establishment of a community trust funded by revenue from the sale of energy;
- 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 approximately 80% (40) will be low and medium-skilled and 20% (10) high skilled positions. The majority of the beneficiaries are therefore likely to be historically disadvantaged (HD) members of the community from Middleburg, Colesburg and Cradock.

Over time 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 IYLM IDP.

The establishment of a community trust funded by revenue generated from the sale of energy from the proposed PVSEF also creates an opportunity to support local economic development in the area. ACED has indicated that they are committed to establishment of a community trust. Community trusts provide an opportunity to generate a steady revenue stream that is guaranteed for a 20 year period. The revenue from the proposed PVSEF plant can be used to support a number of social and economic initiatives in the area, including:

- Education;
- Farming, including irrigation projects;
- Training and skills development;
- Support for SMME's.

The long term duration of the revenue stream also allows local municipalities and communities to undertake long term planning for the area. Experience has however also shown that community trust can be mismanaged. This issue will need to be addressed in order to maximise the potential benefits associated with the establishment of a community trust.

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 social benefit for society as a whole.

**Potential negative impacts**

- The visual impacts and associated impact on sense of place;
- Potential impact on tourism.

The findings of the SIA indicate that the significance of the potential visual impacts and impact on tourism will be low. 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)	Medium (Positive impact)
<b>Benefits associated with the establishment of a community trust</b>	Medium (Positive impact)	High (Positive impact)
<b>Establishment of infrastructure for the generation of renewable energy</b>	Medium (Positive impact)	Medium (Positive 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)

#### **5.2.4 Assessment of cumulative impacts**

The cumulative impacts associated with solar energy facilities, such as the proposed Middleburg PVSEF plant, are largely linked to the impact on sense of place and visual impacts. In the case of the proposed Middleburg PVSEF plant the significance of the potential cumulative social impacts, specifically the impact on the landscape, was rated to be low.

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 PVSEF plants 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 key roads in the area, such as the N9. Given the importance of the N9, the potential for sequential visibility impacts (e.g. the effect of seeing two or more wind farms (solar facilities) along a single journey do exist. This is an issue that the national and provincial environmental authorities need to take into account when considering the location of renewable energy facilities, specifically facilities located near national roads and important tourist routes.

#### **5.2.5 Transmission line options**

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

#### **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 negative social cost.

The No-Development option would also result in a loss in employment opportunities associated with both the construction and operational phase. In addition, the benefits associated with the establishment of a community trust funded by revenue generated from the sale of energy from the PVSEF would be forfeited. The revenue from the proposed PVSEF plant can be used to support a number of social and economic initiatives in the area. These benefits would be forgone if the proposed PVSEF plant is not developed. Given the limited economic opportunities in the area this would represent a significant negative social cost for the local community.

#### **5.2.7 Decommissioning phase**

Given the number of people affected (~ 50), the decommissioning of the facility does have the potential to have a negative social impact on the local community. However, 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). However, 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).

ACED 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 20 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.

### **5.3 CONCLUSIONS AND RECOMMENDATIONS**

The findings of the SIA indicate that the development of the proposed Middleburg PVSEF plant will create employment and business opportunities for locals during both the construction and operational phase of the project. The establishment of a community trust funded by revenue generated from the sale of energy from the proposed PVSEF also creates an opportunity to support local economic development in the area. This represents a significant social benefit for an area where there are limited opportunities.

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 ACED Middleburg PVSEF is therefore supported by the findings of the SIA.

### **5.4 IMPACT STATEMENT**

The findings of the SIA undertaken for the proposed ACED Middleburg PVSEF indicate that the development will create employment and business opportunities for locals during both the construction and operational phase of the project. The establishment of a community trust also creates an opportunity to support local economic development in the area. 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.

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:**

### **REFERENCES**

#### **Interviews**

- Mr. and Mrs Erasmus, Landowner – Beskuitfontein, 13/02/2012;
- Mrs. Moore, Landowner adjacent farm Wolwekop, 13/02/2012;
- Chief Whip of the Middelburg LM Council (IYLM), 14/02/2012;
- Mrs Noxolo, Municipal Manager CHDM, 14/02/2012;

Repeated attempts were made to contact Mr Tantsi, the Municipal Manager and IDP Manager for the IYLM. However, he could not be contacted.

#### **Printed sources**

- Australian Environment Protection and Heritage Council (EPHC), *National Wind Farm Development Guidelines* DRAFT - July 2010;
- Barbour, T (August, 2011). *Social Impact Assessment for Ritchie PVSEF*. Prepared for Savannah Environmental;
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- Integrated Resource Plan (IRP) for South Africa (2010-2030);
- Inxuba Yethemba Local Municipality Integrated Development Plan (IDP) (2011-2012).
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- Warren, Charles R. and Birnie, Richard V.(2009) 'Re-powering Scotland: Wind Farms and the 'Energy or Environment? Debate', *Scottish Geographical Journal*, 125: 2, 97 — 126;
- 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);

#### **Internet sources**

- [www.demarcation.org.za](http://www.demarcation.org.za) (Census 2001 data).
- Google Earth 2009.

## ANNEXURE B

### METHODOLOGY FOR THE ASSESSMENT OF POTENTIAL IMPACTS

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

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

#### 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 PVSEF , 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>	ACED, in discussions with its chosen contractor, 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.	
<b>Mitigation: Action/control</b>	<b>Responsibility</b>	<b>Timeframe</b>
<ul style="list-style-type: none"> <li>Attempt to employ 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>Request that contractors appointed investigate option of employing local companies that meet required BEE requirements. Identify potential opportunities for local businesses</li> </ul>	<ul style="list-style-type: none"> <li>ACED &amp; EPC contractor</li> <li>EPC contractor</li> <li>ACED</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> </ul>
<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> </ul>	

	<ul style="list-style-type: none"> <li>• 80% of semi and unskilled labour locally sourced.</li> <li>• Skills audit to determine need for training and skills development programme undertaken within 1 month of commencement of construction phase.</li> </ul>
Monitoring	<ul style="list-style-type: none"> <li>• ACED 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**

Project component/s	Construction and establishment activities associated with the establishment of the PVSEF , including infrastructure etc.	
Potential Impact	The presence of construction workers who live outside the area and who are housed in local towns can affect family structures and social networks.	
Activity/risk source	The presence of construction workers can impact negatively on family structures and social networks, especially in small, rural communities.	
Mitigation: Target/Objective	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.	
Mitigation: Action/control	Responsibility	Timeframe
<ul style="list-style-type: none"> <li>• Attempt to ensure that a minimum of 80% of the low-skilled workers are sourced from the local area.</li> <li>• Identify local contractors who are qualified to undertake the required work.</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 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</li> </ul>	<ul style="list-style-type: none"> <li>• ACED and contractors</li> <li>• ACED</li> <li>• ACED</li> <li>• Contractors</li> <li>• Contractors</li> </ul>	<ul style="list-style-type: none"> <li>• Identify suitable local contractors prior to the tender process for the construction phase.</li> <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>

<p>informed at the outset of the construction phase of the conditions contained on the Code of Conduct.</p> <ul style="list-style-type: none"> <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> </ul>	<ul style="list-style-type: none"> <li>• Contactors</li> </ul>	
<p>Performance Indicator</p>	<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>• Local 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>	
<p>Monitoring</p>	<ul style="list-style-type: none"> <li>• ACEDand 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.**

<b>Project component/s</b>	Construction and establishment activities associated with the establishment of the PVSEF , including infrastructure etc.	
<b>Potential Impact</b>	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.	
<b>Activity/risk source</b>	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.	
<b>Mitigation: Target/Objective</b>	To avoid and or minimise the potential impact on local communities and their livelihoods.	
<b>Mitigation: Action/control</b>	<b>Responsibility</b>	<b>Timeframe</b>
<ul style="list-style-type: none"> <li>• The housing of construction workers on the site should be limited to security personnel.</li> <li>• Develop a Code of Conduct for construction workers.</li> <li>• Inform all workers of the conditions contained in the Code of Conduct.</li> <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> </ul>	<ul style="list-style-type: none"> <li>• ACED and contractors</li> <li>• ACED</li> <li>• ACED and Contractor</li> <li>• Contractors</li> </ul>	<ul style="list-style-type: none"> <li>• Develop Code of Conduct prior to commencement of construction phase. The Code of Conduct should be signed by ACED and the contractors before the contractors move onto site;</li> <li>• Inform all construction workers of Code of Conduct requirements before construction phase commences.</li> </ul>
<b>Performance Indicator</b>	<ul style="list-style-type: none"> <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>• ACED and or appointed ECO must monitor indicators listed above to ensure that they have been met for the construction phase.</li> </ul>	

## Increase risk of grass fires

**OBJECTIVE: To avoid and or minimise the potential risk of increased veld fires during the construction phase.**

<b>Project component/s</b>	Construction and establishment activities associated with the establishment of PVSEF , including infrastructure etc.	
<b>Potential Impact</b>	Veld fires can pose a personal safety risk to local farmers and communities, and their homes, crops, livestock and farm infrastructure, such as gates and fences.	
<b>Activity/risk source</b>	The presence of construction workers and their activities on the site can increase the risk of veld fires.	
<b>Mitigation: Target/Objective</b>	To avoid and or minimise the potential risk of veld fires on local communities and their livelihoods.	
<b>Mitigation: Action/control</b>	<b>Responsibility</b>	<b>Timeframe</b>
<ul style="list-style-type: none"> <li>• Ensure that open fires on the site for cooking or heating are not allowed except in designated areas.</li> <li>• Provide adequate fire fighting equipment onsite.</li> <li>• Provide fire-fighting training to selected construction staff.</li> <li>• Compensate farmers / community members at full market related replacement cost for any losses, such as livestock, damage to infrastructure etc.</li> </ul>	<ul style="list-style-type: none"> <li>• ACED and contractors</li> <li>• ACED and contractors</li> <li>• Contractors</li> <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 designated areas for fires are identified on site at the outset of the construction phase.</li> <li>• Ensure that fire fighting equipment and training is provided before the construction phase commences.</li> <li>• Compensate Farmers within 1 month of claim being verified ACED and Contractors</li> </ul>
<b>Performance Indicator</b>	<ul style="list-style-type: none"> <li>• Conditions contained in the Construction EMP.</li> <li>• Designated areas for fires identified on site at the outset of the construction phase.</li> <li>• Fire fighting equipment and training provided before the construction phase commences.</li> <li>• Compensation claims settled within 1 month of claim being verified by Contractors and ACED.</li> </ul>	
<b>Monitoring</b>	<ul style="list-style-type: none"> <li>• ACED 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 PVSEF , 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 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 transport sand and building materials are fitted with tarpaulins or covers.</li> <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> <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 for all heavy vehicles that require such measures during the construction phase commences.</li> <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>
<b>Performance Indicator</b>	<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</li> </ul>	

	<ul style="list-style-type: none"> <li>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>
Monitoring	<ul style="list-style-type: none"> <li>ACED 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.**

Project component/s	Construction phase activities associated with the establishment of the PVSEF and associated infrastructure.	
Potential Impact	The footprint of the solar energy plant and associated infrastructure will result in a loss of land that will impact on farming activities on the site.	
Activity/risk source	The footprint taken up by the solar energy plant and associated infrastructure.	
Mitigation: Target/Objective	To minimise the loss of land taken up by the PVSEF and associated infrastructure and to enable farming activities to continue where possible, specifically grazing.	
Mitigation: Action/control	Responsibility	Timeframe
<ul style="list-style-type: none"> <li>Minimise the footprint of the PVSEF 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>Savannah Environmental and ACED</li> <li>ECO and Contractors</li> </ul>	<ul style="list-style-type: none"> <li>Footprint for PVSEF should be defined in the Construction EMP before construction phase commences.</li> <li>Rehabilitation should be on-going and completed within 3 months of the completion of the construction phase.</li> <li>Meeting/s with local</li> </ul>
Performance Indicator	<ul style="list-style-type: none"> <li>Footprint of PVSEF included in the Construction Phase EMP.</li> <li>Meeting/s held with farmers during construction phase.</li> </ul>	
Monitoring	<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 PVSEF , 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 PVSEF will create approximately 50 full time employment opportunities.	
<b>Mitigation: Target/Objective</b>	In the medium to long term employ as many locals as possible to fill the 50 full time employment opportunities.	
<b>Mitigation: Action/control</b>	<b>Responsibility</b>	<b>Timeframe</b>
<ul style="list-style-type: none"> <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>ACED</li> <li>ACED</li> </ul>	<ul style="list-style-type: none"> <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>Potential locals identified before construction phase completed.</li> </ul>	
<b>Monitoring</b>	<ul style="list-style-type: none"> <li>ACED 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 PVSEF	
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 PVSEF	
Mitigation: Target/Objective	To avoid and or minimise the potential social impacts associated with decommissioning phase of the PVSEF .	
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>ACED</li> </ul>	<ul style="list-style-type: none"> <li>When PVSEF 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>ACED and Department of Labour</li> </ul>	