SOCIAL SCOPING REPORT

FOR

BOULDERS WIND FARM

WESTERN CAPE PROVINCE

FEBRUARY 2018

Prepared for

SAVANNAH ENVIRONMENTAL

By

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EXECUTIVE SUMMARY

INTRODUCTION AND LOCATION

Tony Barbour Environmental Consulting was appointed by Savannah Environmental to undertake a specialist Social Impact Assessment (SIA) as part of the EIA process for the proposed 140 MW Boulders Wind Farm (WF) located near Vredenburg in the Western Cape Province of South Africa. The proposed site is located within the Saldanha Bay Local Municipality (LM) in the area to the north of Vredenburg, between Vredenburg and the coast. This report contains the findings of the Social Scoping Report undertaken as part of the EIA process.

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:

- Collection and review of baseline socio-economic data;
- Review of relevant planning and policy frameworks for the area;
- Site specific information collected during the site visit to the area and interviews with key stakeholders;
- Review of information from similar projects; and
- Identification of social issues associated with the proposed project.

ASSUMPTIONS AND LIMITATIONS

Assumptions

The identification and initial assessment is based on the findings of the SIA undertaken for the previous WF proposed on the site and the author's experience with renewable energy projects, including wind energy projects. In this regard it is assumed that the key social issues are likely to be similar. However, it should be noted that the comments on the social impacts contained in the Social Scoping Report are preliminary and will be confirmed during the Assessment Phase.

Detailed enhancement and mitigation measures will also be identified during the Assessment Phase.

Limitations

No site visit was undertaken in preparing the Social Scoping Report. In this regard it is only possible to effectively interact with key stakeholders once they are fully aware of the new project, which is typically once the Scoping Report has been circulated for comment. However, as indicated above, the author's undertook the SIA for the previous WF proposed on the site and are therefore familiar with the study area and the social issues associated with the establishment of a WF in the area. A site visit and follow-up interviews with key stakeholders will be undertaken as part of the assessment phase. The assessment of key social issues will also be informed by

other key specialist studies, including the Visual Impact Assessment (VIA) and Heritage Impact Assessment (HIA).

SUMMARY OF KEY FINDINGS

The key social issues are associated with:

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

FIT WITH POLICY AND PLANNING

The findings of the review indicated that renewable energy is strongly supported at a national, provincial and local level. The development of and investment in renewable energy is supported by the National Development Plan (NDP), New Growth Path Framework and National Infrastructure Plan, which all make reference to renewable energy. At a provincial level the development of renewable energy is supported by the Western Cape Provincial Strategic Plan, Western Cape Provincial Spatial Development Framework (SDF), West Coast District Municipality Integrated Development Plan (IDP) and SDF and the Saldanha Bay Municipality IDP and SDF.

However, while these documents all support the development of renewable energy in principle, some also provide guidance on the location of renewable energy facilities. These issues will need to be considered by the relevant authorities when considering the application.

CONSTRUCTION PHASE

The key social issues associated with the construction phase include:

Potential positive impacts

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

The construction phase for a single 140 MW WF is expected to extend over a period of ~two years and create approximately ~250 employment opportunities. It is anticipated that approximately 55% (136) of the employment opportunities will be available to low skilled workers, 30% (76) to semi-skilled workers and 15% (38) for skilled personnel. The majority of the low and semi-skilled employment opportunities will be available to local residents in the area, specifically residents from Vredenburg, Saldanha Bay and Paternoster. 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. In order to maximise the potential benefits the developer has committed to employing local community members to fill the low and medium skilled jobs min the bid documentation.

The capital expenditure associated with the construction phase for a 140 MW WF will be in the region of R 2.5 billion (2017 Rand value). The total wage bill for a 140 MW

WF will be in the region of R69 million (2017 Rand value). A percentage of the wage bill will be spent in the local economy which will create opportunities for local businesses in the towns of Vredenburg, Saldanha Bay and Paternoster. 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 be confined to the construction period (2 years).

Potential negative impacts

- Impacts associated with the presence of construction workers on site and in the area;
- Influx of job seekers to the area;
- Increased safety risk to farmers, risk of stock theft and damage to farm infrastructure associated with the presence of construction workers on the site;
- Increased risk of grass fires;
- Impact of heavy vehicles, including damage to roads, safety and dust;
- Impact on farming activities.

Based on the findings of SIAs undertaken for other WFs, the significance of all the potential negative construction impacts is likely to be **Low Negative**. The potential negative impacts associated with the construction phase can be effectively mitigated if the appropriate mitigation measures are implemented. Given that the majority of the low and semi-skilled construction workers can be sourced from the local area the potential risk posed by construction workers on local family structures and social networks is regarded as **low** for the community as a whole.

Table 1 summarises the significance of the impacts associated with the construction phase. The significance ratings will be confirmed during the assessment phase of the EIA. Detailed enhancement and mitigation measures will also be identified during the Assessment Phase.

Table 1: Summary of impacts associated with construction phase[1]

Impact	Significance No Mitigation/ Enhancement	Significance With Mitigation/ Enhancement
Creation of employment and business opportunities	Medium (+)	Medium (+)
Presence of construction workers and potential impacts on family structures and social networks	Medium (-)	Low (-)
Influx of job seekers	Low (-)	Low (-)
Increased risks to livestock and farming infrastructure associated with the construction related activities and presence of construction workers on the site	Medium (-)	Low (-)
Increased fire risk	Medium (-)	Low (-)
Impact of heavy vehicles and construction	Medium (-)	Low (-)

[1] The significance ratings are based on the findings of an SIA undertaken within the area. The findings regarding the significant ratings will be confirmed during the assessment phase for the Boulders WF.

activities		
Impact on farming activities	Medium (-)	Low (-)

OPERATION PHASE

Based on the findings of previous work undertaken within the area the key social issues affecting the operation phase include:

Potential positive impacts

- The establishment of renewable energy infrastructure and the generation of clean, renewable energy;
- Creation of employment and business opportunities. The operation phase will also create opportunities for skills development and training;
- Benefits associated with the establishment of a Community Trust.
- Benefits associated with SED and ED revenue contributions of the facility, as stipulated by the REI4P

Development of renewable energy infrastructure

The establishment of renewable energy infrastructure, such as the proposed Boulders WF, should be viewed, firstly within the context of the South Africa's current reliance on coal powered energy to meet the majority of its energy needs, and secondly, within the context of the success of South Africa's Renewable Energy Independent Power Producer Procurement Programme (REIPPPP).

Based on a review of the REIPPPP, the programme has not only resulted in significant investment in South Africa and created a number of socio-economic opportunities and benefits, specifically for historically disadvantaged rural communities, the establishment of renewable energy facilities has also addressed environmental issues associated with climate change and the consumption of scarce water resources typically associated with the generation of energy from fossil fuels.

Creation of employment and business opportunities

The total number of permanent employment opportunities associated with a 140 MW WF would be ~28. Of this total ~4 are low skilled workers, 10 semi-skilled and 6 skilled. The annual wage bill for the operation phase will be ~R 2.5 million (2017 Rand value). The majority of the low and semi-skilled beneficiaries are likely to be historically disadvantaged (HD) members of the community. Given the location of the proposed facility the majority of permanent staff is likely to reside in the towns of Vredenburg, Saldanha Bay or Paternoster.

Community Trust

The establishment of a community benefit structure (typically, a Community Trust) also creates an opportunity to support local economic development in the area. The requirement for the project to allocate funds to socio-economic contributions (through structures such as Community Trusts) provides an opportunity to advance local community projects, which is guaranteed for a 20 year period (project lifespan). The revenue from the proposed WF can be used to support a number of social and economic initiatives in the area, including but not limited to:

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

The 2016 REIPPPP Overview notes that to date (across 6 bid windows) a total contribution of R19.3 billion has been committed to Socio-economic Development (SED) initiatives linked to Community Trusts. Of this total commitment, R15.2 billion has been specifically allocated to local communities where the IPPs operate. The Green Jobs study (2011), found that the case for wind power is enhanced by the positive effect on rural or regional development. Wind farms located in rural areas create an opportunity to benefit the local and regional economy through the creation of jobs and tax revenues.

The long term duration of the contributions from the WF also enables local municipalities and communities to undertake long term planning for the area. Experience has, however, shown that Community Trusts 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 or other community benefit structure (entity). The REIPPP programme does however have stringent audit requirements in place to try and prevent the mismanagement of trusts.

Potential negative impacts

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

Visual impacts and impact on sense of place

The potential visual impacts associated with the previous WF were identified as one of the key concerns. In this regard a number of stakeholders, specifically residents in Britannica Heights, raised concerns regarding the visual impacts associated with the development of a wind farm. A number of residents from Paternoster also raised concerns regarding visual impacts. These concerns are also likely to apply to the proposed Boulders WF. However, a number stakeholders interviewed, including residents from Paternoster, also indicated that they did not believe that the wind turbines associated with wind farm will result in a negative visual impact. An assessment of the potential visual impacts associated with the proposed Boulders WF will be informed by the findings of the VIA and follow up interviews.

Impact on property values

The potential impact of property values linked to the visual impacts was identified as one of the key concerns associated with the development of a wind farm during previous work undertaken within the area. These concerns are also likely to apply to the proposed Boulders WF. The area that will potentially be affected is Britannica Heights. The findings of the literature review indicate that the most comprehensive study appears to be the study by Gibbons (2014), which found that "averaging over wind farms of all sizes" the price reduction was around 5-6% within 2km, falling to less than 2% between 2 and 4km, and less than 1% by 14km which is at the limit of likely visibility. An assessment of the potential impact on property values associated with the proposed Boulders WF will be informed by the findings of the VIA and the location of the individual wind turbines.

Impact on tourism

Based on the findings of the literature review there is limited evidence to suggest that the proposed WF would impact significantly on the area's tourism industry, specifically Paternoster. The findings of the literature review also indicated that wind

farms do not impact on tourist routes. This is despite the concerns raised by the representatives from the tourism sector interviewed as part of the SIA undertaken for the previous WF. In this regard the findings of research undertaken by Professor Atchison (April, 2012) for the Scottish Government found that the "findings from both primary and secondary research relating to the actual and potential tourism impact of wind farms indicate that there will be neither an overall decline in the number of tourists visiting an area nor any overall financial loss in tourism-related earnings as a result of a wind farm development". An assessment of the potential impact on tourism in the area associated with the proposed Boulders WF will be informed by the findings of the VIA and follow up interviews.

Table 2 summarises the significance of the impacts associated with the operation phase. The significance ratings will be confirmed during the assessment phase of the EIA. Detailed enhancement and mitigation measures will also be identified during the Assessment Phase.

Table 4.2: Summary of impacts associated with operation phase[2]

Impact	**Significance No Mitigation/ Enhancement**	**Significance With Mitigation/ Enhancement**
Promotion of renewable energy projects	High (-)	High (+)
Creation of employment and business opportunities	Medium (+)	Moderate (+)
Establishment of Community Trust	Medium (+)	High (+)
Visual impact and impact on sense of place[3]		
Impact on property values	Low (-)	Low (-)
Impact on tourism	Low (- and +)	Low (- and +)

CUMULATIVE IMPACTS

Cumulative impact on sense of place

There are a number of renewable energy projects proposed within a 50km radius of the study area, including WFs at Darling, Hopefield and Velddrift. The potential for cumulative impacts associated with combined visibility (whether two or more wind energy facilities will be visible from one location) and sequential visibility (e.g. the effect of seeing two or more wind energy facilities along a single journey, e.g. road or walking trail) is therefore high. However, as indicated above, the findings of the review on tourism found that wind farms do not impact on tourist routes.

At a site specific level, the proximity of the West Coast One (WCO1) WF has the potential for both facilities (WCO1 and the proposed Boulders WF) to be viewed as a single large WF as opposed to two separate WFs. While viewing these WFs as a single large facility, as opposed to separate facilities, will not reduce the overall visual impact on the scenic character of the area, it has the potential to reduce the cumulative impact on the landscape. The proximity of the WFs also has the benefit of concentrating the visual impacts on the areas sense of place in to one area as opposed to impacting on a number of more spread out areas.

[2] The significance ratings are based on the findings of the SIA undertaken for the previous WF on the site. These findings will be confirmed during the assessment phase for the Boulders WF.
[3] Significance ratings will be informed by findings of VIA to be undertaken during the Assessment Phase.

The potential cumulative impact on the area's sense of place and assessment of significance will be informed by the findings of the VIA undertaken for the proposed Boulders WF.

Cumulative impact on services
The establishment of the proposed Boulders WF and the other renewable energy facilities in the WCDM and SBLM may place pressure on local services, specifically medical, education and accommodation facilities. This pressure will be associated with the potential influx of job-seekers to the area associated with the construction and operation phases of renewable energy projects proposed in the area, including the proposed WF. The potential impact on local services can be mitigated by employing local community members. With effective mitigation the impact is likely to be **Low Negative.**

The significance will be confirmed during the assessment phase of the EIA.

Cumulative impact on local economies
In addition to the potential negative impacts, the establishment of the proposed WF and other renewable energy projects in the area also has the potential to create a number of socio-economic opportunities for the WCDM and SBLM, which, in turn, will result in a positive social benefit. The positive cumulative impacts include creation of employment, skills development and training opportunities and the creation of downstream business opportunities. The Community Trust associated with each project will also create significant socio-economic benefits. This benefit is likely to be **Medium to High Positive** with enhancement.

The significance will be confirmed during the assessment phase of the EIA.

POTENTIAL HEALTH IMPACTS

The findings of a literature review undertaken by the Australian Health and Medical Research Council published in July 2010 indicate that there is no evidence of wind farms posing a threat to human health. The research also found that wind energy is associated with fewer health effects than other forms of traditional energy generation and in fact will have positive health benefits (WHO, 2004). Based on these findings it is assumed that the significance of the potential health risks posed by the proposed WF is of **Low Negative** significance.

NO-DEVELOPMENT OPTION

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

However, at a provincial and national level, it should be noted that the proposed WF development is not unique. In this regard, a significant number of other renewable energy developments are currently proposed in the Western Cape and other parts of

South Africa. Foregoing the proposed establishment of WFs would therefore not necessarily compromise the development of renewable energy facilities in the Western Cape Province and or South Africa. However, the socio-economic benefits for local communities in the WCDM and SBLM would be forfeited.

DECOMMISSIONING PHASE

In the case of decommissioning ~28 permanent jobs associated with the decommissioning phase would be lost. The potential impacts associated with the decommissioning phase can however be effectively managed with the implementation of a retrenchment and downscaling programme. With mitigation, the impacts are likely to be **Low Negative.**

The significance will be confirmed during the assessment phase of the EIA.

CONCLUSION

The development of the proposed Boulders WF will create employment and business opportunities for locals during both the construction and operation phases of the project. Based on experience with other WF projects, the negative impacts associated with the construction phase can be effectively mitigated if the recommended mitigation measures are implemented. The detailed mitigation measures will be outlined in the Social Impact Assessment Report (SIAR).

The establishment of a Community Trust will also benefit the local community. The proposed development will also represent an investment in clean, renewable energy infrastructure, which, given the negative environmental and socio-economic impacts associated a coal based energy economy and the challenges created by climate change, represents a significant positive social benefit for society as a whole. A review of the Renewable Energy Independent Power Producers Procurement Programme (REIPPPP) indicates that the programme has resulted in significant socio-economic benefits, both at a national level and at a local, community level. These benefits are linked to foreign Direct Investment, local employment and procurement and investment in local community initiatives.

The key concerns identified during the SIA undertaken for the previous WF on the site relate to the visual impacts associated with the wind turbines and the potential impact on property values and tourism. These concerns were raised by property owners in Britannica Heights and Paternoster. These concerns will also apply to the proposed Boulders WF. A number of local residents interviewed as part of the SIA for the previous WF also indicated that they did not regard the wind farm as having a negative visual impact.

The potential impact on property values, specifically property values in Britannica Heights, will depend on the location and proximity of the wind turbines to residential areas. In terms of the potential impact on tourism, based on the literature review, there is limited evidence to suggest that the proposed WF would impact on the area's tourism industry. The findings also indicate that wind farms do not impact on tourist routes.

The potential visual and cumulative impact on the areas sense of place and assessment of significance will be informed by the findings of the VIA undertaken for the proposed Boulders WF as part of the Assessment Phase of the EIA.

ACRONYMS

DEA&DP	Department of Environmental Affairs and Development Planning (Western Cape)
DEA	Department of Environmental Affairs (National)
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
IDP	Integrated Development Plan
IPP	Independent Power Producer
kV	Kilovolts
LED	Local Economic Development
LM	Local Municipality
Mtoe	Million tonnes of oil equivalent
MW	Megawatt
PGWC	Provincial Government Western Cape
SBLM	Saldanha Bay Local Municipality
SDF	Spatial Development Framework
SIA	Social Impact Assessment
WCDM	West Coast District Municipality
WF	Wind Energy Facility

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SECTION 1: INTRODUCTION

1.1 INTRODUCTION

Savannah Environmental has been appointed by Vredenburg Wind Farm (Pty) Ltd to manage the Environmental Impact Assessment (EIA) process for the establishment of a proposed 140 MW Boulders Wind Farm (WF) and associated infrastructure in an area to the north of Vredenburg in the Western Cape Province between the town and the coast (Figure 1.1).

Tony Barbour has been appointed by Savannah Environmental to undertake a specialist Social Impact Assessment (SIA) as part of the EIA process. This report contains the findings of the Social Scoping Report undertaken as part of the EIA process.

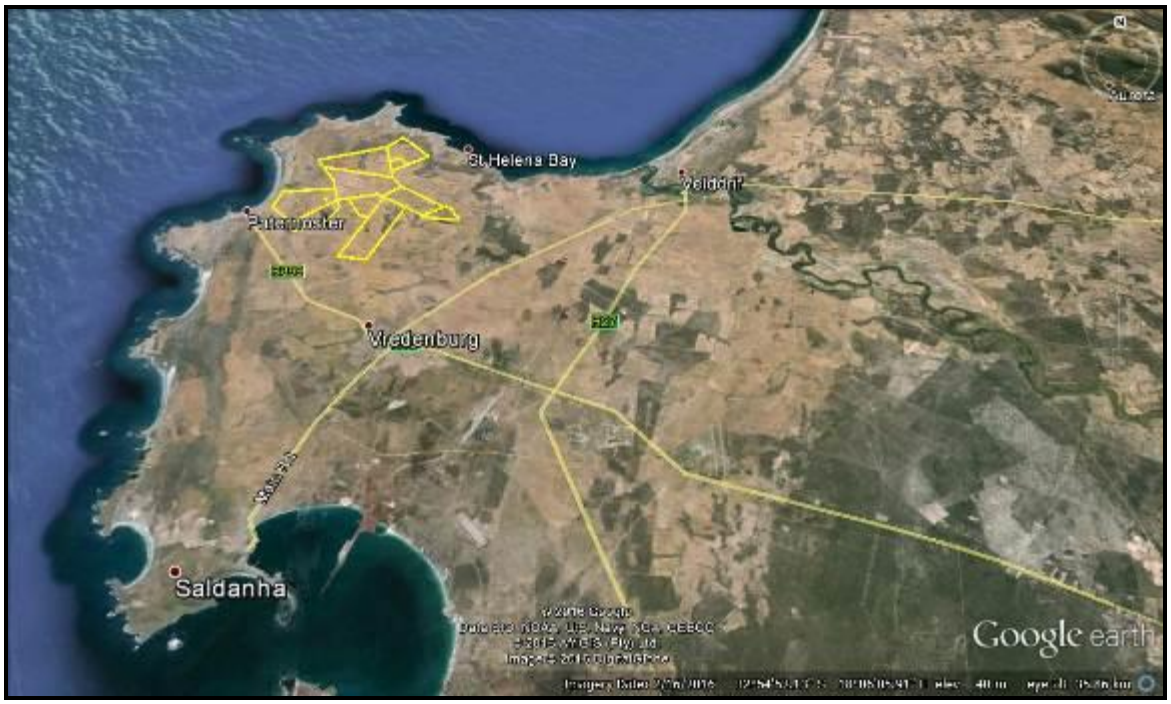

Figure 1.1: Location of proposed Boulders WF

1.2 APPROACH TO STUDY

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 development;
- A description and assessment of the potential social issues associated with the proposed development and the associated alternatives;
- Identification of enhancement and mitigation measures aimed at maximizing opportunities and avoiding and or reducing negative impacts.

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

- Describing and obtaining an understanding of the proposed intervention (type, scale, and 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;
- Site visit and semi-structured interviews with key stakeholders and affected individuals and communities;
- Assessing and documenting the significance of social impacts associated with the proposed intervention;
- Identification of enhancement and mitigation measures aimed at maximizing opportunities and avoiding and or reducing negative impacts; and
- Consideration of other renewable energy projects within a 30km radius from the proposed site that may pose cumulative impacts.

The identification of potential social issues associated with the proposed WF is based on observations during the project site visit, review of relevant documentation, experience with similar projects and the general area. Annexure A contains a list of the secondary information reviewed. Annexure B outlines the assessment methodology used to assign significance ratings during the assessment phase.

One of the key challenges facing SIA does not necessarily involve the physical disruption of human populations, but understanding the meanings, perceptions and/or social significance of these changes. In order to understand the role of a social assessment in the EIA process one needs to define what social impacts are. This issue 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. However, in many instances these constructs are frequently treated as perceptions or emotions, to be distinguished from "reality."

The social construct of reality is a characteristic of all social groups, including the agencies that attempt to implement changes, as well as the communities that are affected (Guidelines and Principles for Social Impact Assessment, 1994). The tendency of development agencies and proponents to dismiss the concerns of others as being merely imagined and perceived is therefore a key issue that needs to be addressed by social impact assessments.

In this regard the findings of the SIA indicate that while certain stakeholders are opposed to the proposed WF, others either support the development and or do not have an objection to the establishment of a WF on the proposed site.

1.3 PROJECT DESCRIPTION

A WF consists of multiple wind turbines which are used to capture the kinetic energy of the wind and generate electricity. This captured kinetic energy is used to drive a generator located within the wind turbine and the energy is subsequently converted into electrical energy. A typical wind turbine consists of four primary components (Figure 1.2):

- The **foundation unit** upon which the turbine is anchored to the ground;
- The **tower** which is a hollow structure allowing access to the nacelle. The height of the tower is a key factor in determining the amount of electricity a turbine can generate. The tower houses the transformer which converts the electricity to the correct voltage for transmission into the grid;
- The **nacelle** (generator/turbine housing). The nacelle houses the gearbox and generator as well as a wind sensor to identify wind direction. The nacelle turns automatically ensuring the blades always face into the wind to maximise the amount of electricity generated; and
- The **rotor** which is comprised of three rotor blades. The rotor blades use the latest advances in aeronautical engineering materials science to maximise efficiency. The greater the number of turns of the rotor the more electricity is produced.

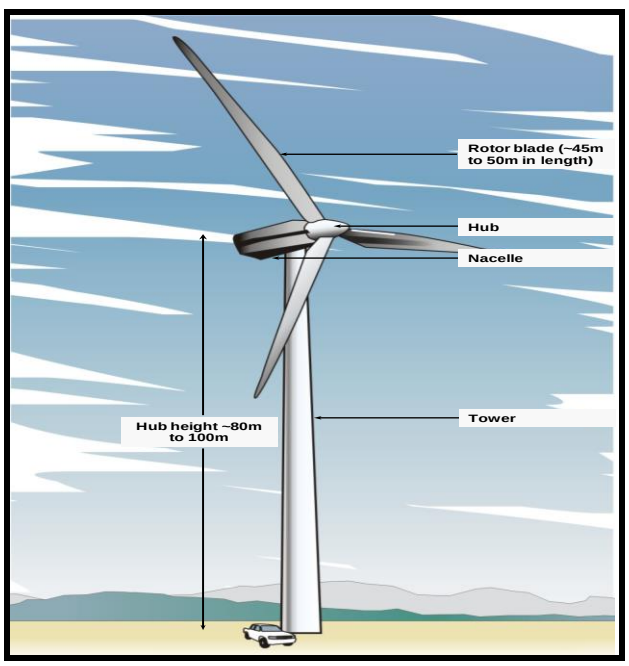

Figure1.2: Typical example of wind turbine structure and components

The amount of energy a turbine can harness is dependent on the wind velocity and the length of the rotor blades. Wind turbines start generating power at wind speeds of between 10 - 15 km/hour, with speeds between 45 - 60 km/hour required for full power operation. In a situation where wind speeds are excessive, the turbine automatically shuts down to prevent damage. A turbine is designed to operate continuously, unattended and with low maintenance for more than 20 years or more. Once operating, a WF can be monitored and controlled remotely, with a mobile team used for maintenance when required.

As indicated above, the number of turbines proposed is up to 45 wind turbines with a contracted capacity of approximately 140MW. The total area under consideration is approximately 5 084ha. The number and placement of turbines will be informed by the findings of the EIA. The energy will be fed into the Eskom grid. The project is therefore an Independent Power Producer (IPP) project. The proposed WF is located on the following properties:

- Boebezaks Kraal 2/40;
- Boebezaks Kraal 3/40;
- Boebezaks Kraal 5/40;
- Frans Vlei 2/46;
- Schuitjes Klip 3/22;
- Davids Fontyn 9/18;
- Schuitjes Klip 1/22;
- Het Schuytje 1/21;
- Davids Fontyn 7/18;
- Uitkomst RE/6/23.

The infrastructure includes:

- Up to 45 wind turbines with a maximum hub height of up to 120m. The tip height of the turbines will be up to 165m;
- Concrete foundations to support the turbines;
- Cabling between the turbines, to be laid underground where practical;
- An on-site substation of up to 200m x 200m in extent to facilitate the connection between the wind farm and the electricity grid;
- An overhead 132kV power line, with a 32m servitude (to be assessed as part of a separate basic assessment), to connect the facility to the electricity grid ;
- A transformer station for each wind turbine;
- Access roads to the site and between project components with a width of approximately 6m;
- Laydown areas, crane hardstand pads, administrative buildings and offices.

1.4 ASSUMPTIONS AND LIMITATIONS

1.4.1 Assumptions

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

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

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

Identification of impacts
The identification and initial assessment is based on the findings of the SIA undertaken for the previous WF proposed on the site and the author's experience with renewable energy projects, including wind energy projects. In this regard it is assumed that the key social issues are likely to be similar. However, it should be noted that the comments on the social impacts contained in the Social Scoping Report are preliminary and will be confirmed during the Assessment Phase.

Detailed enhancement and mitigation measures will also be identified during the Assessment Phase.

1.4.2 Limitations

Demographic data
The information contained in some key policy and land use planning documents, such as Integrated Development Plans etc., may not contain data from the 2011 Census. However, where required this data has been updated with the relevant 2011 Census data.

Follow up site visits
No sites visit was undertaken in preparing the Social Scoping Report. In this regard it is only possible to effectively interact with key stakeholders once they are fully aware of the new project, which is typically once the Scoping Report has been circulated for comment. However, as indicated above, the author's undertook the SIA for the previous WF proposed on the site and are therefore familiar with the study area and the social issues associated with the establishment of a WF in the area. A site visit and follow-up interviews with key stakeholders will be undertaken as part of the assessment phase. The assessment of key social issues will also be informed by other key specialist studies, including the Visual Impact Assessment (VIA) and Heritage Impact Assessment (HIA).

1.5 SPECIALIST DETAILS

Tony Barbour, the lead author of this report, is an independent specialist with 25 years' experience in the field of environmental management. In terms of SIA experience Tony Barbour has undertaken in the region of 200 SIAs and is the author of the Guidelines for Social Impact Assessments for EIA's adopted by the Department of Environmental Affairs and Development Planning (DEA&DP) in the Western Cape in 2007. Annexure C contains a copy of Tony Barbour's CV.

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

1.6 DECLARATION OF INDEPENDENCE

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

1.7 REPORT STRUCTURE

The report is divided into five sections, namely:

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

SECTION 2: DESCRIPTION OF POLICY AND PLANNING CONTEXT

2.1 INTRODUCTION

Legislation and policy embody and reflect key societal norms, values and developmental goals. The legislative and policy context therefore plays an important role in identifying, assessing and evaluating the significance of potential social impacts associated with any given proposed development. An assessment of the "policy and planning fit[4]" of the proposed development therefore constitutes a key aspect of the Social Impact Assessment (SIA). In this regard, assessment of "planning fit" conforms to international best practice for conducting SIAs. Furthermore, it also constitutes a key reporting requirement in terms of the applicable Western Cape Department of Environmental Affairs and Development Planning's *Guidelines for Social Impact Assessment* (2007).

For the purposes of meeting the objectives of the SIA the following national, provincial and local level policy and planning documents were reviewed, namely:

National

- National Energy Act (2008);
- White Paper on the Energy Policy of the Republic of South Africa (December 1998);
- White Paper on Renewable Energy (November 2003);
- Integrated Resource Plan (IRP) for South Africa (2010-2030);
- The National Development Plan (2011);
- New Growth Path Framework (2010);
- National Infrastructure Plan (2012);
- Strategic Environmental Assessment for wind and solar energy in South Africa (CSIR, 2015).

Provincial and local

- White Paper on Sustainable Energy for the Western Cape Province (2010);
- The Western Cape Provincial Strategic Plan 2014-2019 (2014);
- The Western Cape Land Use Planning Act, 2014;
- The Western Cape Provincial Spatial Development Framework (2014 Revision);
- The Western Cape Climate Change Response Strategy (2014);
- The Western Cape Infrastructure Framework (2013);
- The Western Cape Green Economy Strategy Framework (2013);
- The One Cape 2040 Strategy (2012);

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

- The Western Cape Amended Zoning Scheme Regulations for Commercial Renewable Energy Facilities (2011);
- The Western Cape Draft Strategic Plan (2010);
- The Strategic Initiative to Introduce Commercial Land Based Wind Energy Development to the Western Cape – Towards a Regional Methodology (2006);
- The Guidelines for the Management of Development on Mountains, Hills and Ridges in the Western Cape (2002);
- West Coast District Municipality Integrated Development Plan (2017-2021);
- West Coast District Municipality Spatial Development Framework (2014);
- Saldanha Bay Municipality Spatial Development Framework (2011);
- Draft Saldanha Bay Municipality Spatial Development Framework (2017);
- Saldanha Bay Municipality Integrated Development Plan (2017-2022).
- Saldanha Bay Municipality Local Economic Development Plan (2005);
- Saldanha Bay Municipality Mid Term Strategic Local Economic Development Strategy (2013);

Section 2 also provides a review of the Renewable Energy Programme in South Africa and a summary of some of the key social issues associated with wind farms based on international experience. A summary of international studies on the potential impacts on property values and tourism is also provided.

2.2 NATIONAL POLICY ENVIRONMENT

2.1.1 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 wind:

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

2.1.2 White Paper on the Energy Policy of the Republic of South Africa

Investment in renewable energy initiatives, such as the proposed WF, 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 therefore 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; and
- Generally lower running costs, and high labour intensities.

Disadvantages include:

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

2.1.3 White Paper on Renewable Energy

The White Paper on Renewable Energy (November, 2003) (further referred to as the White Paper) supplements the *White Paper on Energy Policy*, which 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[5], Government is determined to make good on the country's commitment to

[5] The Kyoto Protocol is a protocol to the United Nations Framework Convention on Climate Change (UNFCCC), aimed at fighting global warming. The UNFCCC is an international environmental treaty with the goal of achieving "stabilisation of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system". The Protocol was initially adopted on 11 December 1997 in Kyoto, Japan and entered into force on 16 February 2005. As of November 2009, 187 states have signed and ratified the protocol (Wikipedia)

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" the final plenary on 18 December 2009. The accord endorses the continuation of the Kyoto Protocol and confirms that climate change is one of the greatest challenges facing the world. In terms of the accord South Africa committed itself to a reduction target of 34% compared to business as usual. In this regard the IRP 2010 aims to allocate 43% of new energy generation facilities in South Africa to renewables.

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

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

2.1.4 National Integrated Resource Plan for Electricity (2010-2030)

The current iteration of the Integrated Resource Plan (IRP) for South Africa, initiated by the Department of Energy (DoE) after a first round of public participation in June 2010, led to the Revised Balanced Scenario (RBS) that was published in October 2010 and later updated in November 2013. 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 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 (2140 million tons of carbon dioxide per year after 2024) was maintained; and
- Energy efficiency demand-side management (EEDSM) measures were maintained at the level of the RBS.

Figure 2.1 indicates the new capacities of the Policy commitment. The dates shown in Figure 2.1 indicate the capacity required in order to avoid security of supply concerns. In terms of allocation, wind was allocated between 600 and 800MW per year and solar between 500 and 700MW. With the Round 4 announcement in April 2015 the allocation for wind and solar was doubled in the so called Round 4b and even an expedited Round 4c with an additional 1 800MW introduced for bidding in October 2015. Furthermore, the department announced that the current REIPPPP will be extended with an additional 63 00MW for the upcoming years. To date, there have been four (4) volumes or bidding windows under the REIPPPP. In April 2015, the DoE announced additional preferred bidders for the REIPPPP Bid Window 4 contributing 1 121MW to the national grid to a total of 5 243MW procured since the implementation of the programme to date (DoE, 2015). The key conclusions that are relevant to the renewable energy sector is that an accelerated roll-out of renewable energy options should be allowed in order to derive the benefits of these technologies.

The IRP is currently being updated in order to reflect recent developments in the energy sector, country and region. A Draft IRP for public comment and stakeholder engagement was published in November 2016. The comment period closes in February 2017[6].

[6] Media Briefing by Minister Tina Joemat-Petterson, 22 November 2016. (http://www.gov.za/speeches/minister-tina-joemat-pettersson-media-briefing-integrated-energy-plan-and-integrated)

	New build options								Committed					Non IRP
	Coal (PF, FBC, imports, own build)	Nuclear	Import hydro	Gas – CCGT	Peak – OCGT[1]	Wind	CSP	Solar PV	Coal	Other	DoE Peaker	Wind[2]	Other Renew.	Co-generation
	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW
2010	0	0	0	0	0	0	0	0	380	260	0	0	0	0
2011	0	0	0	0	0	0	0	0	679	130	0	0	0	0
2012	0	0	0	0	0	0	0	300	303	0	0	400	100	0
2013	0	0	0	0	0	0	0	300	823	333	1020	400	25	0
2014	500	0	0	0	0	400	0	300	722	999	0	0	100	0
2015	500	0	0	0	0	400	0	300	1444	0	0	0	100	200
2016	0	0	0	0	0	400	100	300	722	0	0	0	0	200
2017	0	0	0	0	0	400	100	300	2168	0	0	0	0	200
2018	0	0	0	0	0	400	100	300	723	0	0	0	0	200
2019	250	0	0	237	0	400	100	300	1446	0	0	0	0	0
2020	250	0	0	237	0	400	100	300	723	0	0	0	0	0
2021	250	0	0	237	0	400	100	300	0	0	0	0	0	0
2022	250	0	1 143	0	805	400	100	300	0	0	0	0	0	0
2023	250	1 600	1 183	0	805	400	100	300	0	0	0	0	0	0
2024	250	1 600	283	0	0	800	100	300	0	0	0	0	0	0
2025	250	1 600	0	0	805	1 600	100	1 000	0	0	0	0	0	0
2026	1 000	1 600	0	0	0	400	0	500	0	0	0	0	0	0
2027	250	0	0	0	0	1 600	0	500	0	0	0	0	0	0
2028	1 000	1 600	0	474	690	0	0	500	0	0	0	0	0	0
2029	250	1 600	0	237	805	0	0	1 000	0	0	0	0	0	0
2030	1 000	0	0	948	0	0	0	1 000	0	0	0	0	0	0
Total	6 250	9 600	2 609	2 370	3 910	8 400	1 000	8 400	10133	1722	1020	800	325	800

2011 Determinations 2012 Determinations Eskom commitments (pre IRP)

Notes: 1. OCGT is seen as natural gas in the determination
2. Includes Sere (100MW)

Source: IRP 2010-2030 Update Report November 2013

Figure 2.1: IRP2010 Policy Adjusted Plan with Ministerial Determinations

2.1.5 National Development Plan

The National Development Plan (NDP) contains a plan aimed at eliminating poverty and reducing inequality by 2030. The NDP identifies 9 key challenges and associated remedial plans. Managing the transition towards a low carbon national economy is identified as one of the 9 key national challenges. Expansion and acceleration of commercial renewable energy is identified as a key intervention strategy.

2.1.6 The New Growth Path Framework

The aim of the New Economic Growth Path Framework is to enhance growth, employment creation and equity. Central to the New Growth Path is a massive investment in infrastructure as a critical driver of jobs across the economy. In this regard the framework identifies investments in five key areas namely: ***energy***, transport, communication, water and housing.

The New Growth Path also identifies five other priority areas as part of the programme, through a series of partnerships between the State and the private sector. The Green Economy as one of the five priority areas to create jobs, including expansions in construction and the production of technologies for solar, wind and biofuels. In this regard clean manufacturing and environmental services are projected to create 300 000 jobs over the next decade.

2.1.7 National Infrastructure Plan

The aim of the National Infrastructure Plan (2012) is to transform the economic landscape while simultaneously creating significant numbers of new jobs and strengthen the delivery of basic services.

As part of the Plan 18 strategic integrated projects (SIPs) have been identified, including three energy SIPs, namely:

- SIP 8: Green energy in support of the South African economy;
- SIP 9: Electricity generation to support socio-economic development;
- SIP 10: Electricity transmission and distribution for all.

2.3 PROVINCIAL POLICY AND PLANNING ENVIRONMENT

2.3.1 White Paper on Sustainable Energy for the Western Cape

The White Paper on Sustainable Energy (2010) compliments the Climate Change Strategy and Action Plan, specifically by *inter alia* setting targets for renewable energy generation. The White Paper is currently in Final Draft form. Once approved by Provincial cabinet, it will constitute the formal Western Cape's policy document on which the Western Cape Sustainable Energy Facilitation Bill will be based. The purpose of the White Paper and the envisaged Bill is to create an enabling policy environment in the Western Cape in order to promote and facilitate energy generation from renewable sources, as well as efficient energy use technologies and initiatives. This objective forms an integrated part of the Province's overarching energy policy objectives, namely:

- To ensure medium-term energy security, sufficient in order to support economic growth;
- To reduce energy poverty;
- To increase the efficient use of energy;
- To limit the greenhouse emissions footprint (associated with the use of fossil fuels);
- To decrease reliance on finite fossil fuel resources and associated unpredictable commodity markets.

The White Paper forms part of the Provincial Government of the Western Cape's (PGWC) strategy aimed at removing a number of barriers (e.g. energy pricing, legal, institutional, low levels of investment confidence, insufficient knowledge) currently frustrating the province's energy goals by preventing the adoption and commercialisation of clean energy (including electricity generation from renewable sources such as wind and solar) technologies and initiatives. The White Paper notes that, with regard to sources of renewable energy, wind and solar both represent

commercially viable options in the province. The document proposes that special focus should be given to these renewable subsectors and specific associated technologies in order to achieve critical mass of installation, and therefore drive down establishment costs and ensure permanent employment opportunities.

The context, vision, identified goals and targets of the White Paper are briefly discussed below:

Context

The White Paper is rooted in an integrated set of high-level provincial policy documents, and in particular, the Western Cape Provincial Growth and Development Strategy (PGDS)[7] of 2007 and the Sustainable Development Implementation Plan (SDIP)[8]. These policy documents provide the overarching framework for the White Paper. Information contained in the internal Sustainable Energy Strategy (SES) document which was prepared in 2007, largely informed the drafting of the White Paper.

Vision

The vision underpinning the White Paper, the so-called "2014 Sustainable Energy Vision for the Western Cape" is the following:

The Western Cape has a secure supply of quality, reliable, clean and safe energy, which delivers social, economic and environmental benefits to the Province's citizens, while also addressing the climate change challenges facing the region and the eradication of energy poverty (White Paper, 15).

Goals

Six goals have been identified in order to realise to this vision. These goals are grouped under economic, environmental and social sustainability categories. These goals are listed below, and each briefly discussed:

- Goal 1: alleviate energy poverty (Social sustainability): This goal is aimed at addressing energy related under-development amongst the province's poor.
- Goal 2: Improve the health of the nation (Social sustainability): The goal is aimed at reducing health and safety risks associated with the use of fuels such as coal, paraffin and wood, as well as the generation of electricity from fossil fuels. In this regard it is noted that the use of renewable sources to generate electricity does not emit harmful substances such as smoke, or oxides of sulphur nitrogen into the atmosphere. The document notes that improving the health of the nation includes improving the health of the individual through improved indoor climate as well as the outdoor climate.
- Goal 3: Reduce harmful emissions (Environmental sustainability): The White Paper notes that improved energy efficiency and increased use of renewable energy are cost effective methods to reduce Greenhouse Gas emissions, thereby

[7] The main purpose of the PGDS is to provide a strategic framework for accelerated and shared economic growth in the Western Cape. The PGDS builds on the 12 iKapa strategies which were developed by the relevant PGWC line departments, including the Provincial Spatial Development Framework (PSDF), the Sustainable Development Implementation Plan (SDIP) and the Climate Change Response Strategy (CCRS).

[8] This plan includes programmes to encourage biodiversity, effective open-space management and the better management of settlements by ensuring the sustainability of services in respect of water, waste, energy and land. The SES and White Paper both effectively form part of SDIP.

combating Climate Change. Addressing Climate Change opens the door to utilising additional finance mechanisms to reduce CO_2 emissions.

- Goal 4: Reduce negative footprints in our environment (Environmental sustainability): The White Paper notes that the use of fossil fuels has a documented negative impact on the regional and local environment. The negative impacts include, but are not limited to individual health, ground water pollution and air pollution. Any reduction in the use of fossil fuels through switching to clean(er) energy sources and more efficient energy uses is therefore desirable.
- Goal 5: Enhance energy security (Economic sustainability): The massive South African black-outs that started first in the Western Cape in early 2006 alerted the Province to its energy vulnerability. It is essential that the Western Cape increases its resilience against external energy supply disruptions and the massive price fluctuations caused by national or international decisions with regard to energy commodities (coal, oil):
- Goal 6: Improve economic competitiveness (Economic sustainability): It has been demonstrated internationally that one of the ways to improve economic competitiveness is by improving industrial and commercial energy efficiency. Support of industrial best practice energy management as a tool to stay competitive and improve the economy is important.

Targets

The PGWC agreed to targets for electricity from renewable sources and for energy efficiency to be achieved by 2014. The purpose of the White Paper is to quantify the relevant targets, and further to provide an incremental implementation plan until 2014. In this regard, four targets have been identified. Of these, two are of direct relevance to the proposed WF:

- Target for electricity generated from renewable sources: *15% of the electricity consumed in the Western Cape will come from renewable energy sources in 2014, measured against the 2006 provincial electricity consumption* (White Paper, p21)

In this regard, the White Paper notes that in order to reach this target, it will be necessary for the PGWC to ensure that the environment to establish and generate renewable energy is such that a minimum of 15% of the electricity can be produced, and must be consumed, from renewable sources.

- Target for reducing carbon emissions: *The carbon emissions are reduced by 10% by 2014 measured against the 2000 emission levels* (p. 23).

In this regard, the White Paper notes that achieving this target largely depends on achieving the renewables target.

2.3.2 Western Cape Climate Change Response Strategy

The Western Cape Climate Change Response Strategy (WCCCRS) was adopted in February 2014. It is an update of the 2008 Western Cape Climate Change Response Strategy and Action Plan. The key difference with the 2008 Strategy is a greater emphasis on mitigation, including strategically suitable renewable energy development.

The 2014 WCCCRS was updated in accordance with the National Climate Change Response Policy (2013). It is strongly aligned with the overarching provincial objectives contained in the Western Cape Draft Strategic Plan 2009-2014 (2010), and the WCP 'Green is Smart' Strategy (2013). In line with the National Climate Change Response Policy, the Strategy takes a two-pronged approach to addressing climate change:

- **Mitigation:** Contribute to national and global efforts to significantly reduce Green House Gas (GHG) emissions and build a sustainable low carbon economy, which simultaneously addresses the need for economic growth, job creation and improving socio-economic conditions;
- **Adaptation:** Reduce climate vulnerability and develop the adaptive capacity of the Western Cape's economy, its people, its ecosystems and its critical infrastructure in a manner that simultaneously addresses the province's socio-economic and environmental goals (WCCCRS, 2014: 21).

The Strategy will be executed through an implementation framework which will include an institutional framework for both internal and external stakeholders, with a strong emphasis on partnerships. The framework still has to be prepared. A monitoring and evaluation system is further envisaged in order to track the transition to a low carbon and climate resilient WCP. Policy aspects dealing with mitigation are of specific relevance to renewable energy generation.

Energy and emissions baseline

Based on comprehensive 2009 data for all WCP energy use sectors, the following key findings pertain to the overall WCP energy use and emissions:

- Electricity is the key fuel used in the WCP, accounting for 25% of total consumption;
- Approximately 95% of base load electricity is generated from low-grade coal and the remainder by nuclear. The vast bulk of WCP electricity is generated in the north of the country;
- In terms of emissions by sector, electricity is responsible for 55% of the total WCP emissions. According to the Strategy, this supports the case for a shift towards renewables and clean energy types;
- Transport (55%) was the greatest energy user, followed by industry (33%). Although domestic consumption accounted for only 8%, it accounted for 18% of emissions, again underscoring the emission-intensive nature of electricity generation.

Mitigation potential

According to the Strategy, the main opportunities for mitigation include energy efficiency, demand-side management, and moving towards a less-emission intensive energy mix. In the short to medium term, four areas with mitigation potential are identified, including promoting renewable energy in the form of both small-scale embedded generation as well as large scale renewable energy facilities. Together with other mitigation interventions, renewable energy generation is anticipated to result in the following socio-economic benefits:

- Reducing fuel costs to households and business;
- Improving the competitiveness of businesses;

- Job creation opportunities with the development of new economic sectors;
- Local business development;
- Improved air quality (with positive health impacts);
- Reducing the negative impact of large carbon footprints, particularly for export products; and
- Reducing stress on energy needs of the province and thereby increasing energy security.

Renewable energy as strategic focus area
Initial implementation of the Strategy will focus on select focus areas aligned with the National Climate Change Response Policy Flagship Programmes and the Western Cape Green Economy Strategy Framework. These focus areas will be reviewed every five years – i.e. the next revision is due in 2019. The renewable energy area is identified as one of nine focus areas. The Strategy document notes that renewable energy is a key area of focus for the Western Cape, and forms a fundamental component of the drive towards the Western Cape becoming the green economy hub for Africa.

The role of the provincial government is identified as 'supporting the development of the renewable energy industry through promoting the placement of renewable energy facilities in strategic areas of the Western Cape as well as through supporting renewable energy industries'.

The document further notes that waste-to-energy opportunities are being investigated in order to facilitate large-scale rollout. Current investigation includes understanding the most appropriate technologies for waste-to-energy projects as well as developing decision support tools for municipalities to implement waste-to-energy programmes.

Priority areas identified for renewable energy development
- Development of the Renewable Energy economy in the WCP, in terms of both the appropriate placement of renewable energy as well as manufacturing opportunities;
- Development of waste-to-energy opportunities for both municipal and private sector (commercial and industrial) waste systems;
- Development of opportunities around small-scale renewable energy embedded generation activities .

2.3.3 Provincial Strategic Plan 2014-2019 (2014)

The Western Cape Provincial Strategic Plan (WCPSP) builds upon the 2009-2014 Draft Provincial Strategic Plan. The vision statement for the 2014-2019 Plan is 'a highly skilled, innovation-driven, resource-efficient, connected, high-opportunity society for all'. The five strategic goals identified for the 2014-2019 period are:

- Creating opportunities for growth and jobs;
- Improving education outcomes and opportunities for youth development;
- Increasing wellness and safety, and tackling social ills;
- Enabling a resilient, sustainable, quality and inclusive living environment; and
- Embedding good governance and integrated service delivery through partnerships and spatial alignment .

Five sets of performance indicators are identified to evaluate the implementation of strategies aimed at meeting these goals. In addition, the Plan identifies a number of 'game changers' which would help tackling provincial development issues, and result in palpable 'real' change. It envisages that action plans would be prepared by 2015/2016 for each of these identified 'game changers'. The 'game changers' are clustered around three priority areas. Key aspects of the Plan pertaining to renewable energy are discussed below.

Strategic Goal 1: Energy security as a 'game changer'

Economic growth/ job creation (Strategic Goal 1) is one of the 3 priority development areas. Achieving Energy security is identified as one of two 'game changers' for fostering this. In this regard, the Plan notes that inadequate electricity supplies over the next five years and beyond threaten to be a significant impediment to growth. A number of strategic priorities are identified to address the issue, including the development of a WCP green economy. The Plan notes that PGWC has prioritised the development of a green economy, with the further aim of establishing it as the green economy hub of Africa.

The Plan further notes that the WCP has already established itself as the national renewable energy hub. In that regard, it is home to developers which have developed more than 60% of the 64 successful projects in the first three rounds of the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP), as well as a wide array of firms that provide key support services for the industry (engineering and environmental consultancies, legal advisors, etc.). The WCP has also seen the majority of local manufacturing investments. Three of the 4 PV manufacturers that have been successful in supplying to the REIPPPP projects are located in Cape Town, whilst 2014 also saw major global players opening manufacturing facilities for inverters and wind turbine towers.

Future energy security priorities include scaling up renewable energy generation in the province, including embedded generation such as rooftop solar PV, and the importation of liquid natural gas as an alternative power source to support further rollout of renewable energy and low carbon fuel switching (WCPSP, 2014: p.21).

Strategic Goal 4: Reducing greenhouse emissions and improving air quality

The Plan notes that PGWC is committed to improving the resilience, sustainability, quality and inclusivity of the urban and rural settlements. The Plan further notes that while some resource conservation and management improvements have been made, the WCP resource base remains under severe pressure.

Water, energy, pollution and waste, transport and resource-use inefficiencies are leading to extensive environmental degradation, poor air quality, loss of biodiversity and agricultural resources, which result in a deterioration of social and economic conditions. These challenges are further exacerbated by population growth and climate change impacts. It is anticipated that climate change will worsen air quality, as its effects will slow air circulation around the world, resulting in an increase in the frequency and severity of disasters (e.g. fires, floods, and coastal erosion) (WCPSP, 2014: p. 35).

Strategic outcomes pursued under Goal 4 include the enhanced management and maintenance of the ecological and agricultural resource-base; sustainable and integrated urban and rural settlements; and an improved climate change response.

Four outcomes are prioritised, including reduced greenhouse gas emissions and improved air quality. In this regard, the Plan notes that, as air quality and climate change are integrally linked, activities such as reducing fossil fuel burning will address both these priorities (WCPSP, 2014: p. 36). The Plan does not discuss reduced fossil fuel burning or renewable energy in any further detail.

With regard to interventions to air quality management, the Plan refers to the Western Cape Air Quality Management Plan (WCAQMP). The WCAQMP (2010) and associated working groups focus on key interventions relating to governance and integrated management of air quality, climate change, town and regional planning and transport planning. The WCAQMP does not address renewable energy generation.

2.3.4 Western Cape Land Use Planning Act

In line with the Spatial Planning and Land Use Management Act, (Act 16 of 2013), the Western Cape Land Use Planning Act 2014 (LUPA) was adopted by PGWC in April 2014. Chapter III (which deals with spatial planning matters) sets out the minimum requirements for drafting a Provincial Spatial Development Framework (PSDF) for the WCP.

Of specific relevance, Section 4 requires a PSDF to (3) 'contain at least (*c*) provincial priorities, objectives and strategies, dealing in particular with (*iiii*) adaptation to climate change, mitigation of the impact of climate change, renewable energy production and energy conservation'. This requirement would apply to all future revisions of the PSDF. As such, it indicates PGWC's commitment to renewable energy production in order to respond to climate change.

2.3.5 Western Cape Provincial Spatial Development Framework

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

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

Overarching guiding principles

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

- Spatial justice;

- Sustainability and resilience;
- Spatial efficiency;
- Accessibility, and
- Quality and livability.

Under Sustainability and resilience, the PSDF notes that land development should be spatially compact, resource-frugal, compatible with cultural and scenic landscapes, and should not involve the conversion of high potential agricultural land or compromise ecosystems (p. 22). The 2004 Growth Potential Study was also revised in 2013 as part of the PSDF process[9].

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

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

The WCP Spatial agenda

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

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

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

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

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

Energy
With regard to energy use, the PSDF notes that the Cape Metro and West Coast regions are the WCP's main energy users. It further notes that the WCP's electricity is primarily drawn from the national grid, which is dominated by coal-based power stations, and that the WCP currently has a small emergent renewable energy sector in the form of wind and solar generation facilities located in its more rural, sparsely populated areas. The PSDF also reiterates PGWC's commitment to shifting the economy towards gas[10] as transitional fuel (see WCIP below). Most of the energy discussion in the PSDF is dominated by aspects pertaining to natural gas.

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

- Policy R.4.6: *Pursue energy diversification and energy efficiency in order for the Western Cape to transition to a low carbon, sustainable energy future, and delink economic growth from energy use*;
- R.4.7: *Support emergent Independent Power Producers (IPPs) and sustainable energy producers (wind, solar, biomass and waste conversion initiatives) in suitable rural locations (as per recommendations of the Strategic Environmental Assessments for wind energy (DEA&DP) and renewable energy (DEA)*[11] .

Unlike the 2009 PSDF, the new PSDF does not provide any spatial provisions with regard to REF or transmission line infrastructure. Instead, such determination is envisaged in terms of the WCP WF SEA, the DEA REF SEA, municipal SDFs, etc. In this regard the two policy directives contained in the 2009 PSDF that had a direct relevance for WFs are not contained in the 2014 revision, namely:

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

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

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

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

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

Landscape and scenic assets

A specialist study was undertaken into the Province's cultural and scenic landscapes. This study[12] was one of the informants of the 2014 PSDF. It established that the WCP's cultural and scenic landscapes are significant assets underpinning the tourism economy, but that these resources are being incrementally eroded and fragmented. According to the study agriculture is being reduced to 'islands', visual cluttering of the landscape by non-agricultural development is prevalent, and rural authenticity, character and scenic value are being eroded. The mountain ranges belonging to the Cape Fold Belt together with the coastline are identified as the most significant in scenic terms, and noted to underpin the WCP's tourism economy.

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

- R.5.6: *Priority focus areas proposed for conservation or protection include -*

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

Renewable energy within the Spatial Economy

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

2.3.6 Western Cape Infrastructure Framework

The Western Cape Infrastructure Framework (WCIF) (2013) was developed by the WCP Provincial Department of Transport and Public Works in terms of the Provincial Government's mandate to coordinate provincial planning under Schedule 5A of the

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

Constitution. The objective of the WCIF is to align the planning, delivery and management of infrastructure to the strategic agenda and vision for the Province, as outlined in the 2009-2014 Draft Provincial Strategic Plan. The One Cape 2040 and 2013 Green is Smart strategy were other key informants.

The document notes that given the *status quo* of infrastructure in the province, and the changing and uncertain world facing the Western Cape over the 2-3 decades a new approach to infrastructure is needed. Namely one that satisfies current needs and backlogs, maintains the existing infrastructure, and plans proactively for a desired future outcome. The 2040 vision requires a number of transitions to shift the way in which infrastructure is provided and the type of infrastructure provided in the WCP.

The WCIF addresses new infrastructure development under five major 'systems' (themes), and outlines priorities for each. Energy is one of the 'systems' identified. The document notes that a provincial demand increase of 3% per year is anticipated for the period 2012-2040. Key priorities are in matching energy generation/ sourcing with the demand needed for WCP economic growth. Additionally, the energy focus should be on lowering the provincial carbon footprint, with an emphasis on renewable and locally generated energy.

Energy infrastructure transition
Three key transitions are identified for the WCP Energy 'system' infrastructure, namely:

- Shifting transport patterns to reduce reliance on liquid fuels;
- Promoting natural gas as a transition fuel by introducing gas processing and transport infrastructure; and
- Promoting the development of renewable energy plants in the province and associated manufacturing capacity.

2.3.7 Western Cape Green Economy Strategy Framework

The Western Cape Green Economy Strategy (2013) – 'Green is Smart' - is a framework for shifting the Western Cape economy from its current carbon intensive and resource-wasteful path within a context of high levels of poverty to one which is smarter, greener, more competitive and more equitable and inclusive. The Strategy is closely aligned with provincial development goals and the 2014 WCCCRS.

The strategy notes that two of the WCP's key economic sectors - both of national importance - agriculture and tourism, are vulnerable to climate change. At the same time, these challenges hold significant potential for opportunities linked to attracting investment, economic development, employment creation, and more resilient infrastructure and patterns of consumption. These opportunities are partly linked to the WCP's existing leadership in some fields of green technology, including knowledge services.

The core objective of the Strategy is to position the WCP as the lowest carbon footprint province in South Africa, and a leading green economy hub on the African continent.

Drivers, Enablers and Priorities
The Strategy framework is made up of 5 drivers of the green economy which are market focused and principally private sector driven, and supported by 5 enablers which are either public sector driven, or the product of a collaborative effort.

The five drivers are: smart mobility, smart living and working, smart ecosystems, smart agri-processing and smart enterprise. The relevant cross-cutting enablers are: finance, rules and regulations, knowledge management, capabilities, and infrastructure.

The framework also identifies priorities that would position the WCP as a pioneer and early adopter of green economic activity. These priorities have been identified in terms of the WCP being firstly, a front-runner or pioneer and secondly, an early adopter of innovations and technologies which already exist, but are not widely adopted in South Africa. Some priorities are considered game-changers, and are singled out as 'high level priorities for green growth'.

Three such 'high level priorities for green growth' are identified, two of which are of relevance here:

- Natural Gas and Renewables: Off-shore natural gas, potential gas base-load power plants and renewable energy IPP programme, together with a greenfield gas infrastructure, will be the game-changer for the Western Cape to be the lowest carbon province in South Africa, and achieve significant manufacturing investment;
- Green Jobs: A green growth path without job growth is unsustainable. There must be early pursuit of priorities with a high rate of job growth potential – notably rehabilitation of natural assets, responsible tourism and the waste sector.

Renewable energy servicing hub
'Under the section dealing with drivers, renewable energy is discussed under 'Smart Enterprise'. The WCP's objective in terms of this driver is to establish the WCP as a globally recognised centre of green living, working, creativity, business and investment, and thereby attract investment, business and employment opportunities. Based on existing comparative advantages, three key opportunities are identified, one of which is of relevance here, namely to establish the WCP as Africa's new energy servicing hub.

In this regard, the Strategy document notes that WCP is well placed to be the most important research and servicing hub for the renewable and natural gas energy sectors in South Africa and on the African continent.

In support of this claim, it notes that the Darling Wind Energy Facility (WF) was the first operational WF in the country, and that a number of further WFs and SEFs have been approved for the province under REIPPPP. Estimated investment of REIPPPP projects in the Western Cape in the first two rounds is just under R8 billion (wind and solar). WCP professional service firms play a leading advisory role in REIPPPP projects across the country.

The WCP is further home to the country's first photovoltaic manufacturers, Tenesol/ SunPower and SolaireDirect. On the back of REIPPPP, AEG and jointly, Enertronica and Gefran have also established manufacturing facilities in the Cape, with growing

interest from other companies. South Africa's first dedicated renewable training centre is being established in the Western Cape at the Cape Peninsula University of Technology (CPUT). The aim of the centre is to prepare a skilled labour pool for the new emerging renewable energies: wind, solar and biogas. The first phase will combine theoretical and practical training for wind turbine service technicians and for solar farms. In the long run, the centre will also become a development and research facility for renewable energy.

The Strategy also notes that there are important initial opportunities in the construction of new energy infrastructure. However, the real long-term benefits lie in the servicing of operational infrastructure. In this regard, it is estimated that the annual servicing and maintenance costs of WFs for instance amount to approximately 10% of the initial capital investment.

Public and market sector procurement are identified as some of the key enablers. The creation of a streamlined regulatory system – the reduction of 'red tape' – is identified as a key prerequisite for creating an enabling environment.

A leader in renewable energy research, manufacturing and servicing

Under the section dealing with enablers necessary to unlock development potential, renewable energy is discussed under "Smart Infrastructure". The Strategy document notes that existing infrastructure systems, particularly those relating to energy and transport, are carbon intensive, with high costs to the environment. Opportunities for the WCP are linked to tapping into infrastructural development funding by leveraging existing advantages.

With regard to the energy sector, the Strategy proposes that the WCP becomes an early adopter of natural gas processing and transport infrastructure, and become the hub of solar manufacture and servicing. Natural gas is identified as the key potential 'game changer' of the WCP economy, and presents the best way to transition the economy to a more fully-integrated renewables sector as major part of the WCP fuel mix in the long term. In this regard, the relative ease with which gas-fired stations could be activated make them an ideal supplement to less predictable wind and solar sources.

CSP manufacturing and servicing centre[13]

Surprisingly, WF and Solar PV manufacture and servicing receive no specific mention, while Concentrated Solar (CSP) does. The Strategy document justly notes that while the Northern Cape Province is the best suited for CSP facilities, the WCP has strong existing research capabilities in CSP at the University of Stellenbosch (US), and the WCP's existing manufacturing sector already has the capacity to manufacture many CSP components.

Potential opportunities of commercialisation of CSP technology for local (RSA, Africa) conditions based on US research could be substantial. This subsector is identified as an important area of collaboration between the two provinces to realise the potential benefits. The key action at this stage to initiate a WCP manufacturing and servicing centre is to lobby for support for a pilot of South African designed CSP technologies, adapted to SA conditions.

[13] The revised IRP excludes CSP as an option.

2.3.8 One Cape 2040 Strategy

The One Cape 2040 (2012) vision was developed by the Western Cape Government, the City of Cape Town (CoCT) and the Western Cape Economic Development Partnership. It was adopted as policy by CoCT Council in 2012. It is aimed at stimulating a transition towards a more inclusive and resilient WCP economy. It seeks to set a common direction to guide planning and action and to promote a common commitment and accountability to sustained long-term progress.

The 2040 Strategy does not replace any existing statutory plans. Rather, it is intended as a basic reference point and guide for all stakeholders planning for long-term economic resilience and inclusive growth.

Six key transitions are identified to define the necessary infrastructure-related shifts in the WCP. One of these 6 key transitions is an Ecological transition ('Green Cape') from an unsustainable, carbon-intensive resource use economy, to a sustainable, low carbon-footprint one. The development of renewable energy projects and natural gas are expected to significantly decrease the WCP's carbon footprint.

2.3.9 Western Cape Amended Zoning Scheme Regulations for Commercial Renewable Energy Facilities

Amendments to the Western Cape Land Use Ordinance (1985) (LUPO) were promulgated in 2011 in order to guide the development of commercial renewable energy generation facilities (REFs), mainly wind and solar[14]. The Zoning Scheme amendments are specifically intended to provide guidance with regard to land use compatibility, and applicable development restrictions and conditions, including provision for mandatory rehabilitation post construction and final decommissioning ("abandonment" in terms of the Provincial Notice[15]). The ambit of the Regulations include all REFs as well as associated ("appurtenant") infra/ structure(s) operated for commercial gain, irrespective of whether such feed into the electricity grid or not. The section below provides an overview of key points of relevance to the proposed WF.

Zoning status

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

Land use restrictions

- Restrictions with regard to height are mainly applicable to wind energy facilities (WFs), but associated on-site buildings for all REFs are limited to a maximum of 8,5 m (ground to highest point of roof);
- Restrictions with regard to setback are only applicable to WFs.

Establishment of a Rehabilitation Fund

- Prior to authorisation, the applicant ("owner") must make financial provision for the rehabilitation or management of negative environmental impacts, as well as

[14] Province of the Western Cape (2011). *Provincial Gazette 6894, Friday 29 July 2011;* PN 189/2011 (pp. 1381-6).
[15] "A Renewable energy structure shall be considered *abandoned* when the structure fails to continuously operate for more than one year" .

for negative impacts associated with decommissioning or abandonment of the facility. Such provision should be in the form of a fund to be administrated by the Municipality, and should be to the satisfaction of the competent authority (i.e. Department of Energy).

Land clearing/ erosion management

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

Visual impact management

- Visual and environmental impacts must be taken into account, to the satisfaction of the competent authority;
- Associated structures (i.e. substations, storage facilities, control buildings, etc.) must be screened from view by indigenous vegetation, and/or located underground, or be joined and clustered to avoid adverse visual impacts. In addition, appurtenant structures must be architecturally compatible with the receiving environment;
- Lighting should be restricted to safety and operational purposes, must be appropriately screened from adjacent land units, and should also be in accordance with applicable Civil Aviation Authority requirements.

Operational management and maintenance

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

Decommissioning management

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

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

2.3.10 Western Cape Draft Strategic Plan

The 11 Strategic Objectives embodied in the Western Cape Draft Strategic Plan 2009-2014 (2010) ("Building an Open Opportunity Society for All") embody the key overarching strategic objectives identified by Provincial Government for its term in office from 2009-2014. Although the Draft Plan has been replaced by the WCPSP 2014-2019, it remains of relevance. In this regard, the objectives identified and work groups established in terms of it were some of the key informants of the 2014 WCCCRS. The 2013 WCIP is also explicitly based on the Draft Plan. Of the 11 Outcomes, the following are applicable to REF projects:

- Creating opportunities for growth and jobs (1);
- Developing integrated and sustainable human settlements (6);
- Mainstreaming sustainability and optimising resource use and efficiency (7);
- Reducing and alleviating poverty (9).

According to the plan to achieve the outcomes pertaining to "Mainstreaming sustainability and optimising resource use and efficiency", key measures include:

- The promotion of energy efficiency in households, commerce, industry and all provincial offices, hospitals and schools; a green building programme and a green low-cost housing programme to increase the chances of the poor against climate change impacts.
- Development of a wind energy sector and energy production from alternative sources as well as net metering supported by a small-scale feed-in tariff to encourage small-scale renewable energy production.

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

2.3.11 Strategic Initiative to Introduce Commercial Land Based Wind Energy Development to the Western Cape – Towards a Regional Methodology

The document developed in 2006 remains the most recent DEA&DP publication with regard to the locational/ siting aspects of WFs. The document focuses specifically on the siting of wind energy facilities. Some of the key findings and recommendations that have a potential bearing on the study are briefly summarised below. However, it should be noted that the document does not have Guideline or Policy status.

Cumulative Impact Issues

The experience in Europe is that the very high cumulative impact of wind farms has resulted due to a policy of permitting small (wind) energy schemes in relatively close proximity to each other (only 2.5 km in Denmark). As a result the document recommends that:

- Large installations should be located extremely far apart (30 – 50km), and;
- Smaller installations should be encouraged in urban / brownfield areas.

Recommended Disturbed Landscape Focus
In addition to proposing that smaller facilities should be focused in urban/ brownfield areas, the proposed methodology further recommends focusing on existing disturbed rural landscapes, and in particular, those rural landscapes that have already been "vertically compromised" by the location, for example, of transmission lines, railway lines, and all phone towers.

Protecting Rural Landscape Values (put after "Urban Emphasis")
The document notes that in Europe in the past, a great degree of emphasis was given to quantifying views from residential locations. This policy emphasis has effectively led to commercial-scale renewable energy developments having been pushed into more "remote" rural locations. The study notes that in the South African context this policy would effectively "penalising" rural areas, and compromising wilderness and touristic visual values. As indicated above the area has been impacted upon by existing power and railway lines.

Site Specific Aesthetic Considerations
The document lists the following site-specific recommendations for turbines:

- Stick to linear, non-organic layouts;
- Placement in straight rows is preferred;
- Maintain consistency in height;
- Consistency of type across an entire facility is recommended.

In terms of REF spatial policy development the following initiatives also have a bearing on the proposed WF:

- DEA / CSIR have undertaken a Strategic Environmental Assessment (SEA) aimed at identifying strategic geographical areas best suited for the effective and efficient roll-out of large scale wind and solar PV energy projects, referred to as Renewable Energy Development Zones (REDZs). Through a process of positive and negative mapping as well as wide stakeholder consultation, eight focus areas have been identified as potentially being of national strategic importance for wind and solar PV development;
- According to DEA&DP's website, a WCP SEA for the placement of WFs is currently being undertaken. The project, headed by Paul Hardcastle, is listed as 'under development', and no documents are available yet. The project context is unclear, but it is likely linked to the national REF SEA[16].

2.3.12 Guideline for the Development on Mountains, Hills and Ridges in the Western Cape

The aim of the Guideline (2002) is to provide a decision-making framework with regard to developments which include listed activities in terms of National Environmental Management Act Regulations, and which are proposed in an environment which is characterised by mountains, hills and ridges.

The Guideline notes that mountains, hills and ridges are subject to a range of development pressures. A guiding framework is therefore needed to control development in these areas. Key reasons listed are:

[16] eadp.westerncape.gov.za/wc-sustainable-energy-projects-db/wc-strategic-environmental-assessment-placement-wind-energy (accessed 18-04-15).

- Provide catchment areas for valuable water resources;
- Often characterised by unique and sensitive ecosystems;
- Have aesthetic / scenic value; and
- Provide "wilderness" experience opportunities.

The Guideline defines a mountain, hill or ridge as "*a physical feature that is elevated above the surrounding landscape*".

The Guideline is divided into 2 sections. The second deals with key decision-making criteria which need to be taken into account when adjudicating the suitability of developments in such areas. Key criteria which are of specific relevance to the proposed WF include:

- Development on the crest of a mountain, hill or ridge should be strongly discouraged;
- Preserve landform features through ensuring that the siting of facilities is related to environmental resilience and visual screening capabilities of the landscape;
- Adopt the precautionary principle to decision making;
- The criteria used to assess developments in these areas include, amongst others, density of the development, aesthetics, location, value in terms of "sense of place", character of adjacent land use, character of the general area, and cumulative impacts which may arise from other existing and planned developments in the area.

The proposed WF site is located in a landscape characterised by rolling hills in an agricultural setting. However, it should be noted that the Guidelines were developed in 2002 and do not take into account the locational requirements of WFs.

2.4 DISTRICT AND LOCAL LEVEL POLICY AND PLANNING

2.4.1 West Coast District Municipality Integrated Development Plan

The vision for the WCDM as set out in the WCDM Integrated Development Plan (IDP) (2017-2021) is "a quality destination of choice through an open opportunity to society". The Mission is "to ensure outstanding service delivery on the West Coast by pursuing the following objectives".

The IDP lists a number of Strategic Objectives that are relevant to the proposed development. These include:

- Ensuring environmental integrity for the West Coast;
- Pursuing economic growth and facilitation of jobs opportunities;
- Promoting social wellbeing of the community.

Strategic Objective 1: Ensuring Environmental Integrity for the West Coast
The IDP notes that the environmental integrity of the larger West Coast District is largely transformed from a natural environment to commercial farming practises. However, despite this the area is located within an area that has a high biodiversity value. The IDP also notes the potential risks posed by climate change and the need to develop and implement a climate change strategy.

Strategic Objective 2: Pursuing economic growth and the facilitation of job opportunities
The IDP highlights the importance to developing private public partnerships to support and facilitate economic development in the WCDM. Tourism is listed as a key development sector for regional and local economic development.

Strategic Objective 3: Promoting social wellbeing of the community
The section lists the key economic and social challenges and opportunities facing the area. The challenges that are relevant to the proposed development include:

- Unemployment and dependency on government grants;
- Limited employment opportunities for the youth;
- Social impact of in-migration due to current and future industrial development;

The opportunities include:

- District tourism industry and its contribution to economic development and alleviation of poverty;
- The promotion of the West Coast as a renewable energy investment destination.

The IDP includes a Climate Change Strategy. In this regard the IDP notes that the West Coast area will become a very dry area with less rainfall and less water. Of relevance to the proposed WF, the IDP Notes that the approach to addressing the challenges includes reducing greenhouse gas emissions from energy by switching to renewable energy.

2.4.2 West Coast District Municipality Spatial Development Framework

The vision of the West Coast District IDP (2012-2016) is to provide "A quality destination of choice through an open opportunity society". The spatial vision contained in WCSDF (2014) is "to Promote Sustainable Development, prioritise development in highest growth potential areas, encourage and facilitate development along the key corridors within the West Coast District".

The SDF lists three goals that underpin the West Coast District Spatial Strategy and Vision, namely:

- Goal 1: Enhance the capacity and quality of infrastructure in the areas with the highest economic growth potential, while ensuring continued provision of sustainable basic services to all residents in the District;
- Goal 2: To facilitate and create an enabling environment for employment, economic growth and tourism development, while promoting access to public amenities such as education and health facilities;
- Goal 3: Enhance and protect the key biodiversity and agricultural assets in the district and plan to minimise the human footprint on nature, while also mitigating the potential impact of nature (climate change) on the residents of the district.

The above-mentioned Goals 1, 2 and 3 are focused on the three themes identified in the Provincial Spatial Plan (2012) respectively, namely: built environment, socio-economic development and biophysical environment.

The SDF notes that the strategic locality of the WCDM within the Western Cape Province has a number of spatial planning related implications that are of relevance to the proposed development, namely:

- Existing spatial planning and policies, on a national and provincial level, identified the development potential of the West Coast District and such policies and strategies should guide planning decisions;
- The strategic location of the Saldanha Bay harbour in the district and its potential to be a key catalyst for development and economic growth in the district;
- The study area includes sensitive biodiversity areas that require conservation and responsible planning.

The SDF lists three spatial planning themes, namely:

- Theme 1: The built environment;
- Theme 2: Socio-economic environment;
- Theme 3: Biophysical environment.

Themes 2 and 3 are of specific relevance to the proposed development.

Theme 2: Socio-economic environment

The overarching goal of theme two is to facilitate and create an enabling environment for employment, economic growth and tourism development, while promoting access to public amenities such as education and health facilities.

Manufacturing and agriculture showed contraction during the economic slowdown (recession) period and are two 2 key sectors requiring revitalisation to ensure

sustainable employment opportunities and economic growth in the study area. In terms of employment, agriculture was the key employment generating sector, contributing to almost 25% of employment in the West Coast District. This highlights the key role and importance of the agricultural sector.

The following policies contained in the SDF are relevant:

- *HR1* Promote infrastructure development in locations with medium, high and very high economic growth potential;
- *HR2* Invest in key economic sectors to facilitate development and employment opportunities.

A sectoral analysis and assessment of the West Coast District Economy identified the key sectors for future growth. Of relevance to the study, renewable energy is identified as a key sector. The SDF notes that "wind and solar projects can become a key sector in the study area" and that the manufacture and distribution of renewable energy components, such as wind turbines, can further promote this sector. With regard to manufacturing, although the sector has contracted since 2008 there is potential to grow, especially in the context of the Saldanha Bay IDZ, which will enhance industrial development in the area and will create more employment opportunities.

With specific reference to renewable energy the SDF states that the wind resources in the West Coast District are substantial and comparably high in relation to the rest of the country. The region also leads the country in terms of implementation experience with regards to the establishment of a number of wind farms in the WCDM. In addition the Saldannha Harbour has sufficient infrastructure and capacity to facilitate imported wind turbines into the West Coast District.

The SDF also notes that a number of solar energy projects have been established and/or are being investigated in the area. However, the SDF does indicate that the extent of land requirements, and the environmental impact and loss of potentially arable land does need to be taken into consideration with solar PV projects. Figure 2.2 illustrates the location of renewable energy projects in the WCDM.

The other key sectors listed that are of relevance to the study are agriculture and tourism. The SDF notes that the WCDM has a number of established agricultural production areas, such as the Swartland, Sandveld, Olifantsriver Valley citrus and wine district and the rooibos tea production area. Although reliant on natural and weather conditions, this sector has the potential to contribute more substantially to the economy, through higher productivity, advanced and environmentally sensitive methods, etc.

Tourism is also identified as a key economic sector. The strength of the tourism sector is linked to its proximity to the City of Cape Town. The area is therefore easily accessible as a breakaway destination over weekends. The tourism attractions in the area that are of relevance to the study include the small coastal towns, such as Paternoster, Jacobsbaai and Velddrift.

Of relevance to the study the area's tourism attractions are linked to natural features, scenic qualities and coastal villages. Agriculture linked and cultural tourism

is also identified as a key growth sector, and area linked to towns and villages like Riebeeck Kasteel and Riebeeck West, Goedverwacht, Wupperthal and Ebenhaeser.

The following policies contained in the SDF are relevant:

- *HR3* District tourism assets should be promoted and strengthened;
- *HR4* Key tourism corridors/routes should be promoted.

Theme 3: Bio-physical environment

The overarching goal outlined in the SDF is to promote conservation of Critical Biodiversity Areas by strategically implementing sustainable agricultural activities and urban development where the impact on biodiversity will be the lowest, while also mitigating the potential impact of nature (climate change) on the residents of the district.

The SDF notes that the WCDM is located within in an area that contains a wide range of conservation worthy areas, species of fauna and flora and key biodiversity areas and ecosystems. It is therefore important to ensure that these natural assets be recognised and addressed when spatial planning is considered. The key challenges identified include loss and degrading of sensitive biodiversity areas and conflict between conservation, agriculture and development needs.

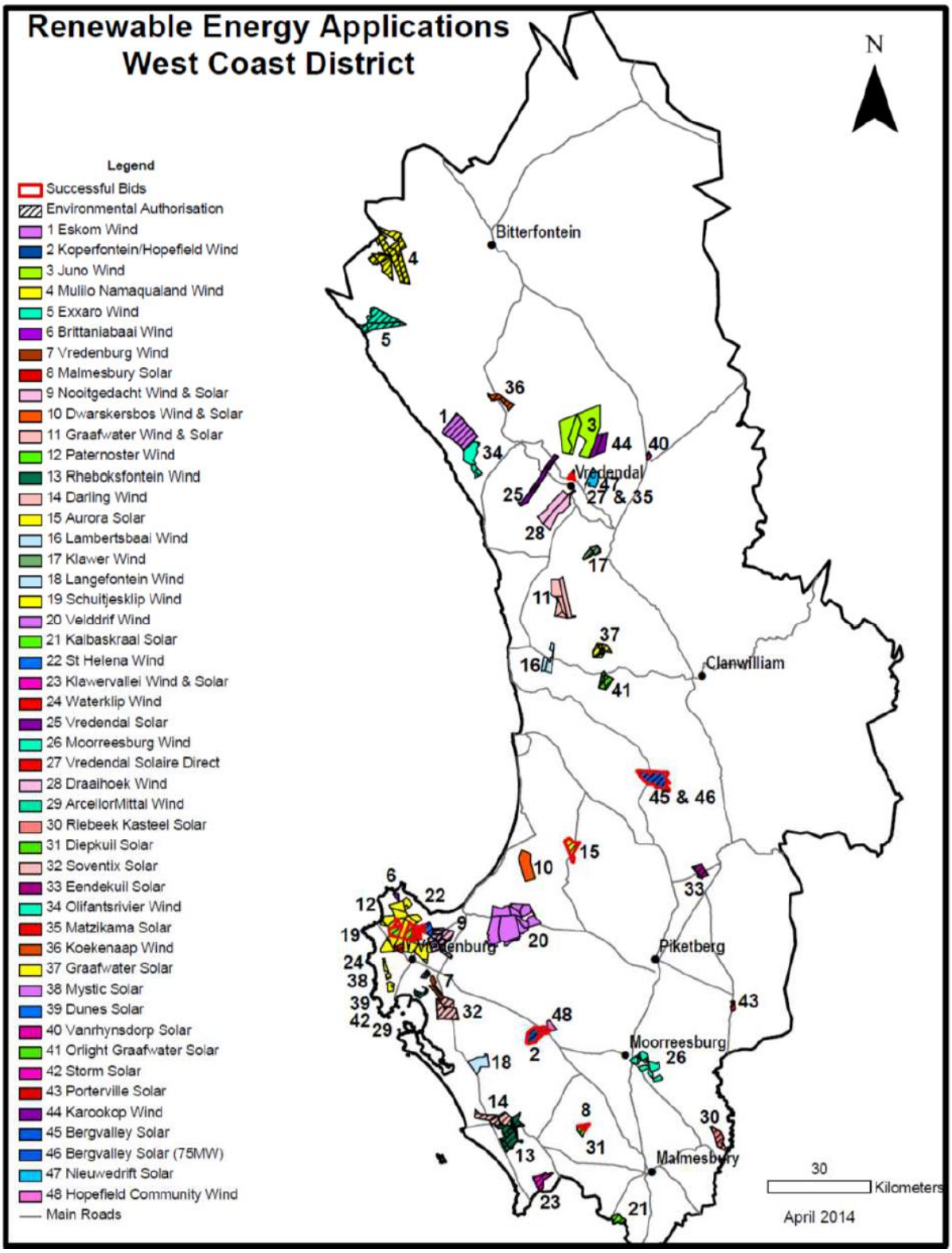

Figure 2.3: Location of potential renewable energy applications in the West Coast District Municipality Area (2014)

The approach adopted to planning is informed by the Bioregional Planning Approach, which identifies a number of spatial planning categories. The proposed renewable energy development is located in an area defined as an Intensive Agricultural Area. These are rural landscapes, largely transformed by agricultural activities that could contain some remaining remnants of threatened ecosystems, but primarily contains no/very little natural vegetation. The SDF provides a list of permissible land uses, including; expansion of agricultural activities, tourism, agricultural industry, recreational facilities and mining and mineral extraction, subject to environmental, biodiversity and botanical assessments. While renewable energy is not specifically listed, it would be compatible land use in an Intensive Agricultural Area.

The SDF also highlights the potential risks posed by climate change. In this regard the Western Cape and South Africa as a whole, has been identified as potentially relatively sensitive to the impacts of climate change. The risks include increased mean annual temperatures and extended dry periods between rainfall events. Of specific relevance to the proposed development eight mitigation focus areas, including Renewable Energy, are identified to address the challenges associated with climate change. The establishment of renewable energy in the WCDM in suitable locations is therefore supported.

The proposed development of renewable energy facilities is also aligned with and supports a number of provincial and district strategic objectives. These include the creation of opportunities for growth and jobs and reduce poverty, and mainstreaming sustainability and optimising resource-use efficiency.

The following policies contained in the SDF are relevant:

- *HR1* Support and promote sustainable economic development;
- *HR2* Invest in key economic sectors for development and employment Opportunities;
- *BE16* Renewable energy sources (wind, solar, etc.) should be established to support and enhance the electricity capacity in the West Coast District.

However, the proposed development of renewable energy facilities must also take into account other key objectives, specifically those relating to tourism

- *HR3* District tourism assets should be promoted and strengthened;
- *HR4* Key tourism corridors/routes should be promoted;
- *BP9* Low density, low impact tourism development could be considered in rural areas, subject to proper assessment in terms of environmental impact, heritage and visual impact.

In this regard the SDF notes:

- *HR 27*: Wind farms should be located where they will cause least visual impact taking into consideration the viability of the project;
- *BE 17:* Wind farms and solar farms should be located where their visual and environmental impact will be the lowest.

In terms of biodiversity the SDF makes reference to two biosphere initiatives, namely the Cape West Coast Biosphere Reserve (CWCBR) and the Greater Cederberg

Biodiversity Corridor (GCBC). The Cape West Coast Biosphere Reserve (CWCBR) is an initiative by Cape Nature, established in 2000 in association with the CWCBR Company to facilitate sustainable development along the West Coast, through stewardship contracts/agreements with private land owners. The CWCBR stretches from Diepriver in the Cape Metropolitan Area northwards along the coastline and coastal plain towards the Bergriver north of Saldanha and Vredenburg.

The GCBC is described as a landscape conservation initiative implemented by CapeNature, which spans across two district municipalities. The bulk of the GCBC occurs within the Bergrivier, Cederberg and Matzikama local municipalities of the West Coast District Municipality, and covers an area of approximately 1.8 million hectares.

2.4.3 Saldanha Bay Integrated Development Plan

The SBLM Integrated Development Plan (2017-2022), notes that the vision of the SBLM is "to enable a future of prosperity for all through effective objectives promoting service excellence". The mission statement linked to the vision provides the framework or context within which the Council's strategies are formulated and notes that the SBLM is a caring institution that excels through:

- Accelerated economic growth for community prosperity;
- Establishment of high quality and sustainable services;
- Commitment to responsive and transparent governance;
- The creation of a safe and healthy environment;
- Long term financial sustainability.

The IDP lists a number of strategic objectives to give effect to the vision and mission for the municipality. The following are relevant to the proposed development:

- To diversify the economic base of the municipality through industrialization, de-regulation, investment facilitation, tourism development whilst at the same time nurturing traditional economic sectors;
- To develop socially integrated, safe and healthy communities;
- To maintain and expand basic infrastructure for economic development and growth;
- To be an innovative municipality through technology, best practices and caring culture.

The IDP notes that the Saldanha Bay area plays an important role in the broader strategic framework of the South African Government as driven by the National Development Plan and National Growth Plan. In this regard Saldanha Bay was identified as a presidential priority development region in 2011 by the National Planning Commission. The National Development Plan 2012 (NDP) identifies the Greater Saldanha region as a special intervention area, attributed to the natural deep water harbour and industrial development prospects that warrant its designation as a national growth management zone.

The Saldanha Bay Industrial Development Zone (IDZ) was officially launched on 31 October 2013 and serves as an important mechanism to achieve the government's aim of sustainable economic development and job creation in the localized economy,

diversification and transformation of the historically under-developed and under-supported industrial maritime and energy sectors; and broadening of the regional and national economic base through industrialisation.

Of key relevance to the proposed WF the IDP notes that the area forms part of Strategic Integrated Project (SIP) 8 which forms part of the government's National Infrastructure Plan of 2012. SIP 8 involves supporting green energy initiatives on a national scale through a diverse range of clean energy option.

The Saldanha Bay area is also identified in OneCape2040 as one of two provincial 'regional' motors of economic significance. The Western Cape Growth and Development Strategy of 2006 also identified Vredenburg and Saldanha as 'Leader towns' and towns with high growth potential where fixed infrastructure investment should be focused. The Socio-economic Profile of Saldanha Bay Municipality issued by the Western Cape Government Provincial Treasury in 2015 indicates that the Saldanha Bay economy is amongst the fastest in the province. The study also found that Saldanha Bay was the fastest growing municipality in the district. The West Coast District Municipality's SDF (2014) also identifies Saldanha Bay as a Major Regional Growth Centre and one three key development areas within the district (WCDM, 2014).

The IDP notes that the "Electrical Network Development Plan for the Saldanha Bay Municipal Area of Supply" dated 25 April 2014 is the current master plan in use and is to be used as guideline for expansion of the electrical networks in the SBLM. The IDP notes that number of documents need to be read in conjunction with this Network Development Plan. The following are of relevance to the proposed WF:

- Local Government Energy Efficiency and Renewable Energy Strategy - November 2014 – SALGA Document;
- Western Cape Climate Change Mitigation Scenarios exercise for the Energy Sector – March 2015 – WCG Environmental Affairs and Development Planning Document;
- Western Cape Climate Change Response Strategy –March 2016 - WCG Environmental Affairs and Development Planning Document

Climate Change

Section 6.2.5.3 of the SBLM IDP addresses the issue of Climate Change. The section notes climate change impacts are already evident in the Western Cape and are negatively impacting and undermining economic and social development. In terms of the SBLM the potential risks identified include rising sea levels and the impact of changing rainfall patterns and extreme weather events. The IDP notes that the municipality is critically linked with its natural resources, particularly marine and agricultural, both of which will face increasing threats from climate change.

Of relevance the proposed WF project the section notes that the Saldanha Bay municipal area has a number of opportunities in terms of low carbon development and that small and large renewable energy must be considered as part of the future planning for the region.

Spatial considerations
The SBLM IDP refers to the SDF approved in 2011. The 2011 SDF promotes an overall spatial management concept where significant predicted growth in the towns of Vredenburg and Saldanha and the Saldanha Port are focused inward along corridors in order to lead to the establishment of a consolidated, major growth centre. Of relevance to the proposed development the 2011 SDF notes that areas of limited predicted growth such as Paternoster, Hopefield and Jacobsbaai are advocated for retention of their status quo, with protection of their natural and historical heritage.

However, the IDP notes significant legislative changes have occurred in the planning regime with the promulgation of the National Spatial Planning and Land Use Management Act, No 16 of 2013 (SPLUMA) and the Western Cape Land Use Planning Act, no 3 of 2014 (LUPA) and the Saldanha Bay Municipality Land Use Planning By-law. This new legislation gives the legal directive for the compilation of a SDF and has made provision for very specific measures according to which SDF's should be drafted and also for greater clarity on the aspects they should address. The IDP indicates that the compilation of a new SDF is expected to be finalised during the course of 2017/2018. As indicated below the Draft SDF was published for comment in September 2017.

2.4.4 Saldanha Bay Municipality Municipal SDF (2011)[17]

The SBLM SDF (2011) notes that the existing landscape of the Saldanha Bay Municipal Area reflects the dynamic nature of the interaction between human and natural elements that have over time combined to create the unique landscape of the area. The combination of these elements and their spatial context creates a number of 'districts' or areas with specific attributes and a distinct character. An awareness and sensitivity to these elements within their spatial, local and broader context is essential to protect and enhance the various districts / area's '**sense of place**'. In this regard, it is therefore critical that the overarching spatial management framework is sensitive to the contextual variances within the municipal area.

The following aspects covered in the SBMSDF are of relevance to the proposed WF development.

Planning Principles
Section 10.3 outlines the planning principles that provide the point of departure for translating the Municipality's Vision into practice. The SDF notes that the principles form the fundamental basis for reasoning and action. The adherence to the broad principles will ensure that the environmental quality, social and economic performance of Saldanha Bay Municipality is improved.

The following principles are relevant to the proposed development:

- Ecological integrity: The diversity, health and productivity of ecosystems should be maintained and environmental and sustainable land use practises promoted.

[17] A revised Draft SDF was published in September 2017 (see below). Until this draft is approved the existing SDF remains in place.

- Risk aversion and precaution: Land use management efforts and the assessment of development applications should adopt a risk averse and precautionary approach under conditions of uncertainty.
- Duty of care: All people and organisations should act with duty of care to conserve and avoid negative impacts on biodiversity, and use biological resources in a sustainable manner, equitably and efficiently.

Strategic Goals and Objectives

Section 10.4 outlines the SDFs Goals and Objectives based upon the Vision and Principles that underpin the SDF. The following are relevant to the proposed development:

- Goal: To develop and maintain a strong local economic base, through the promotion of non-consumptive tourism, industrial development and the role of agriculture in the municipal area's economy. One of the key objectives linked to this goal is to promote the development of tourism infrastructure that conforms to place-specific architectural, environmental and aesthetic requirements;
- Goal: To protect and conserve the heritage resources of the area. The key objectives linked to this goal is to promote the conservation and inclusion of important heritage resources into a municipal area's tourism strategy and improve and develop tourism related facilities;
- Goal: To ensure that on-going development pressure and its spatial implications are managed in a sustainable manner that protects the unique character of the existing cultural landscape and the place-specific character and form of the existing settlement pattern. The key objectives linked to this goal include to retain and strengthen the unique identity of the municipal area and its districts, and to conserve and improve the visual quality of the landscape and the scenic route experience of the primary movement corridors. In this regard the road to Paternoster is identified as an important tourism route.

Tourism as key economic growth sector

The document notes that manufacturing and tourism have emerged as the key sectors with regard to economic growth in the Saldanha Bay Local Municipality (SBLM) area. With regard to tourism, the economies of scenic coastal towns, such as Paternoster, Langebaan and St Helena Bay, are already heavily reliant on tourism inflows. The sector was anticipated to grow 50% by 2010. Proximity to Cape Town ensures year-round tourist-inflows, and consequently year-round economic activity.

The key tourist attractions include annual wildflower displays and the scenic beauty of the coastal settlements. The environmental setting plays a key role in both regards, and protection of the landscape and scenic amenity are identified as pivotal to the region's tourism development strategy and management plan. Marketing focus should be on promoting the SBLM as preferred eco-tourism destination in the West Coast region. Focus should be on the protection and development of the region's natural assets, especially in Paternoster, Langebaan and St Helena Bay.

The importance of establishing a network of scenic roads is highlighted, and the document further notes that scenic routes, especially where these are accessible from country roads, have potential economic advantages for rural communities otherwise cut off from economic opportunities.

Renewable energy generation
The document notes the region's potential for accommodating renewable energy projects, but further notes that the siting of these projects are important from a spatial land use viewpoint in as far as large tracts of land are typically required to accommodate them. Furthermore, with regard to WFs, the turbines are typically visible over long distances.

In terms of siting principles, the document reiterates the principles contained in the 2006 DEA&DP Regional Methodology document (see: Section 4.3.3. above). The key principles reiterated include:

- Excluding commercial WF developments from areas with high aesthetic landscape value;
- Encouraging commercial WFs in areas where they are well located in terms of visual impact, technical and safety criteria and landscape, environmental and planning criteria;
- Encouraging commercial WFs in areas where visual disturbance to the landscape has already occurred (e.g. power transmission lines);
- Focusing on the development of large concentrated wind farms rather than small dispersed locations where the distance between large wind farms is at least 30km, and ideally exceeding 50km.

The SDF does not provide any spatial guidance with regard to the appropriate siting of WFs in the SBLM area.

Paternoster
Section 14.6 provides specific spatial proposals for Paternoster. The section notes that within the municipal context, Paternoster, a historical west coast fishing village fulfils the function of a tourist destination. The local economy of Paternoster town was historically driven by the pelagic fishing and crayfishing industries. However, as with all the towns on the West Coast, fishing resources have largely collapsed. However, this has been largely offset by the increase in growth in tourism. In this regard, the historical west coast architecture and settings of the original fishing village of Paternoster have, together with its unique natural (coastal) setting, resulted in the town becoming an important local and regional tourism resource.

In terms of detailed proposals for the town, the SDF lists a number that are relevant to the proposed development including:

- Paternoster's dependence on the fishing and tourism sectors of the economy and the need to strengthen this;
- The unique historical character and small fishing village atmosphere, which are the most important elements of the tourism sector, require protection;
- Seasonal wild flowers and whale watching opportunities should be used to support the role of the town as an eco-tourism destination;

The SDF also identifies a set of local spatial development principles aimed at promoting the town, including:

- Conservation of the areas heritage assets;
- Tourism development based on the ecological and heritage value of the town and the region;

Activities that should be restricted include:

- Insensitive developments which are architecturally out of scale or not of an appropriate design or materials;

Activities that should be maintained, enhanced and conserved include:

- The unique "small village" character of Paternoster;
- The architectural heritage.

2.4.5 Saldanha Bay Municipality SDF (2017)

The Draft Spatial Development Framework-Draft Conceptual Development Framework (CDF) prepared by CNdV Africa (Pty) Ltd, was published for comment in September 2017. Key sections of the framework that are relevant to the proposed WF are summarised below.

A SWOT analysis was undertaken as part of the development of the SDF. The findings of the analysis that are relevant to the proposed WF are listed below.

Internal strength's

- Tourism – coastal settlements;
- Attractive coastline;
- Coastal settlements' scenic settings; Langebaan, Jacobsbaai, Paternoster, St Helena Bay

Opportunities (external)

- West Coast international floral attraction;
- City of Cape Town day tripper and weekend getaway demand;
- Gauteng and other provinces "semigration"

Weaknesses (internal)

- Low rainfall;
- Water supply dependent on Berg water system

Threats (external)

- Eskom reluctance to commit major energy infrastructure upgrades unless significant commitment from investors;
- Declining fish resources and istability in fishing industry

There is no reference to the establishment of renewable energy facilities, including wind farms, as potential threat to the area, specifically as a potential threat to tourism, in the SWOT analysis.

With specific reference to wind farms, the CDF notes that two windfarms are operating, one north of Vredenburg and one east of Hopefield. The CDF also states that these wind farms form the core of two much bigger areas currently under application for further wind farms. The CDF therefore acknowledges the potential for future development of wind farms in the SBLM. The location of the existing wind farms is illustrated in Fgure 6.1.5 in the CDF report. See Figure 2.4 below.

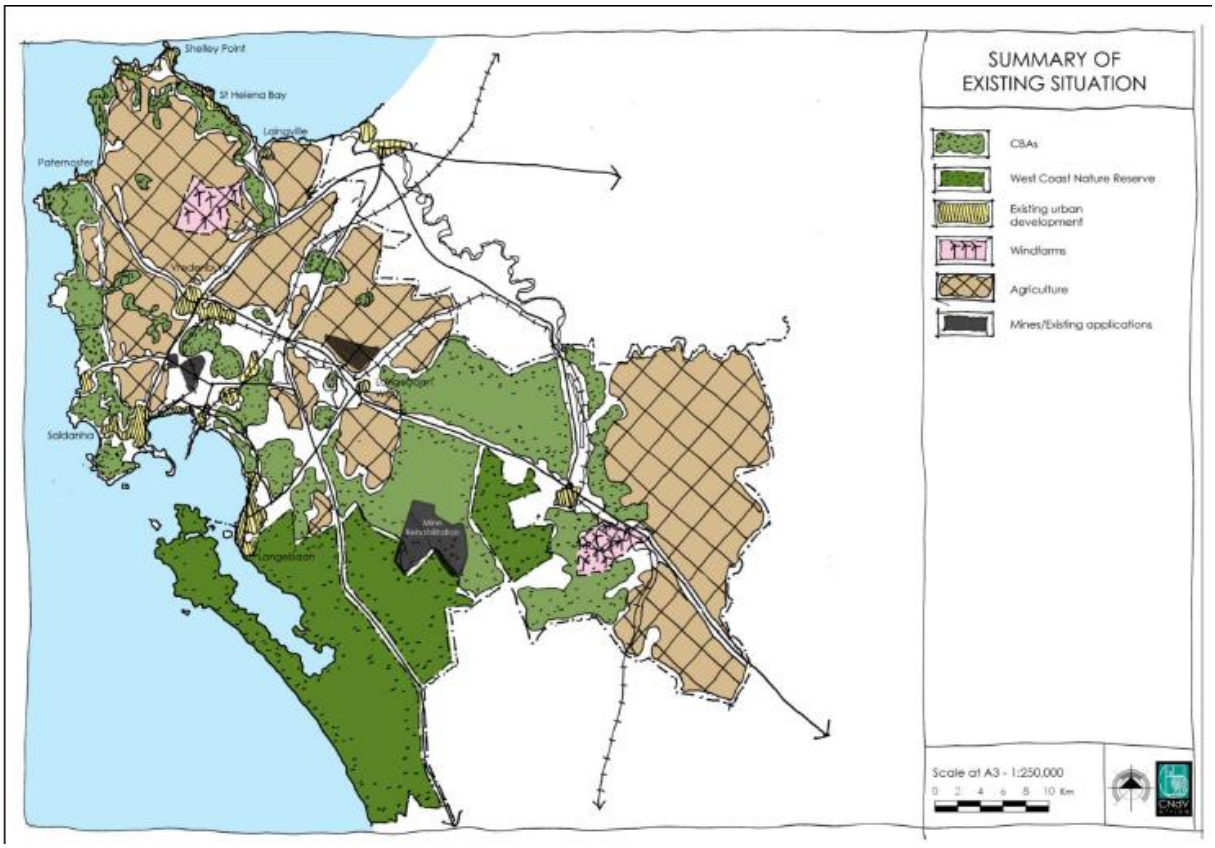

Figure 2.4: Summary of existing land use situation in SBLM

Section 6.1.4 of the CDF, Existing and Future Hazards and Impacts, identifies existing and future hazards and impacts that the municipality needs to manage in its SDF so as to ensure its economic, job creation and environmental sustainability. Of relevance to the proposed WF is the *visual attractiveness of coastal wildernesses*. The CDF notes that a balance must be established between extent of wind farms and maintaining wilderness appeal and attractions for coastal settlements, residents and visitors. Figure 6.1.6 in the Draft CDF illustrate that the current and future potential hazards and impacts and illustrates the location of wind farms in the proposed study area (Figure 2.5 below).

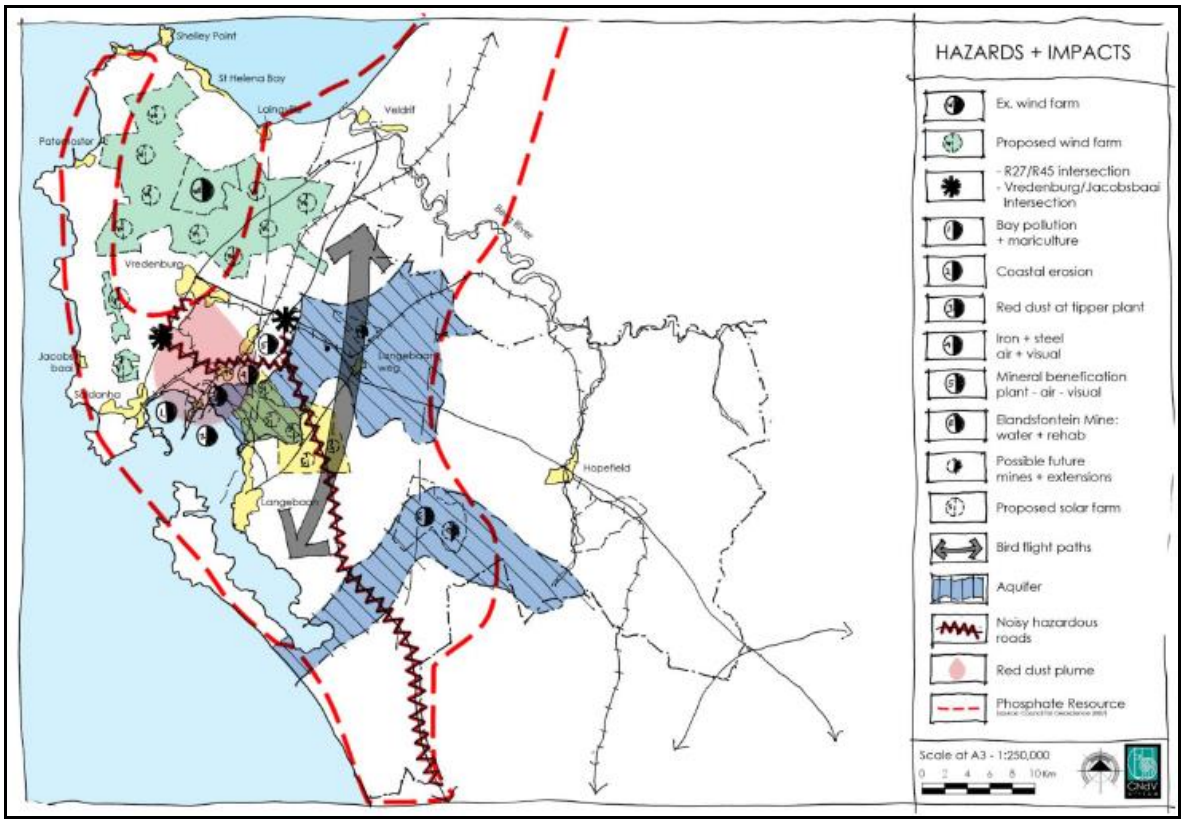

Figure 2.5: Location of current and future hazards and impacts

Based on the findings of the study the Draft CDF report outlines potential conceptual spatial ideas for the SBLM. Of relevance to the proposed WF the report refers to the need to consolidate the coastal wilderness areas and promote tourism and job creation. With regard to coastal wilderness areas and tourism the Draft DCF report recommends creating a continuous wilderness and biodiversity conservation fringe along the coast from Saldana Bay town to Veldrif and building on the current private coastal nature reserves broken only by environmentally friendly coastal developments. In terms of job creation the Draft CDF reports highlights the importance of promoting high-tech economic development and taking advantage of global demand opportunities. Figure 6.1.7 in the CDF report reflects the spatial aspects of the conceptual ideas contained in the CDF (Figure 2.6 below). The area in which the proposed WF is located is identified as agriculture priority areas. In terms of the map the proposed WF is not located in the coastal wilderness / park areas that are proposed.

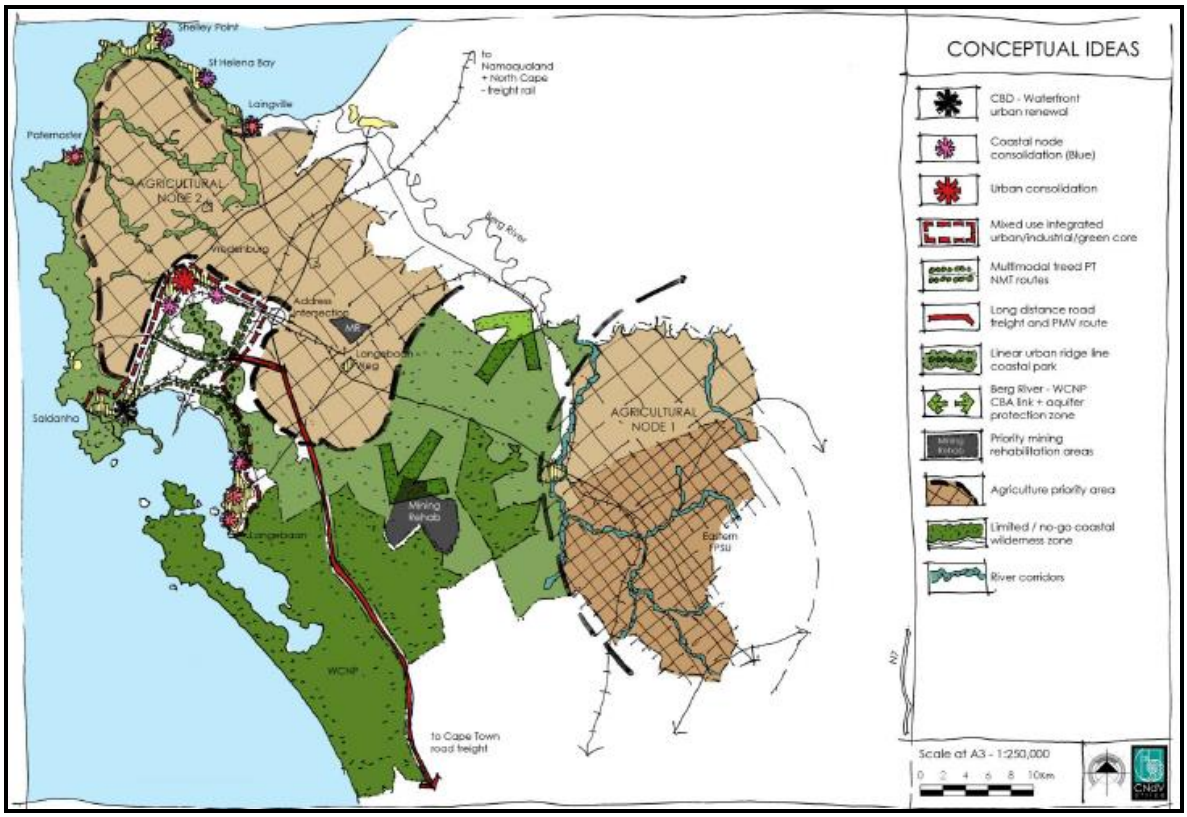

Figure 2.6: Conceptual land uses for the SBLM

The CDF discusses each of the settlements in the SBLM. Paternoster and St Helena Bay are of relevance to the proposed WF.

Paternoster

The CDF notes that historically, Paternoster was established to provide sea access for a small fishing community. However, in the town has become a sought after tourist destination. Almost all the buildings in the settlement have made a sincere effort to respect West Coast vernacular architecture leading to a coherent urban character, which has contributed to its attraction as a holiday and tourism destination. The CDF identifies potential challenges and opportunities. A public meeting was held on the 7th of June 2017 to confirm the public's concerns, issues and vision for Paternoster. One of the key challenges identified was the decline in the local fishing industry. The development of the tourism sector was identified as a key opportunity. Based in the information contained in the Draft CDF document the presence of wind farms was not identified as a challenge or issue if concern at the meeting.

St Helena Bay

The section on St Helena Bay also comments on the importance of tourism to the area, and of relevance notes that wind farms are proposed to the south the area and that care must be taken to ensure that the visual impact does not detract from St Helen Bay's tourism appeal. Says wind turbines footing should be at maximum of 40 AMSL

A public meeting was held on the 6thof June 2017 to confirm the public's concerns, issues and vision for St Helena Bay. Based in the information contained in the Draft CDF document the presence of wind farms was not identified as a challenge or issue if concern at the meeting.

Figure 6.6.2 in the CDF report indicates the boundary of wind farms (pink dotted line) (Figure 2.7 below). Figure 6.6.3 in the CDF report presents the spatial proposals for the St Helena Bay area. The lime green dotted line illustrates the proposed limit of wind turbines footing at maximum of 40 AMSL (Figure 2.8 below).

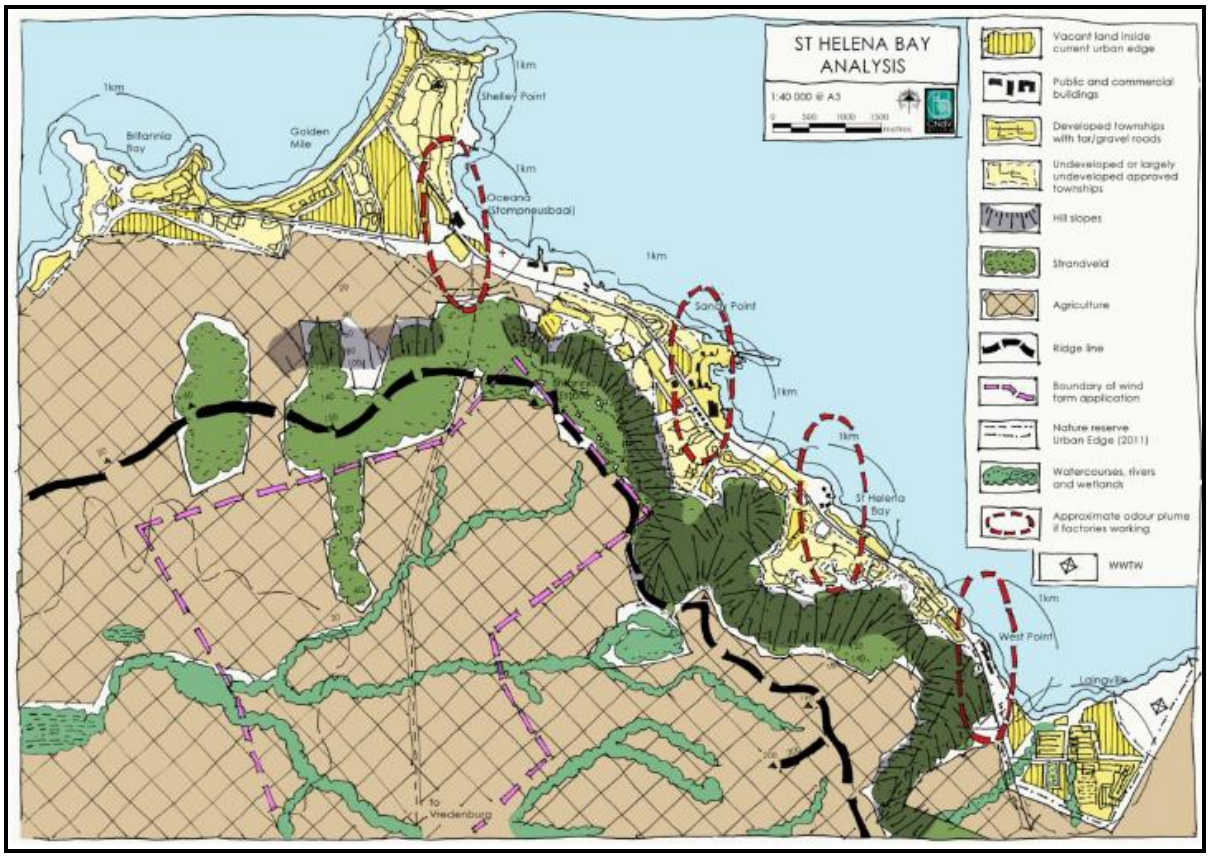

Figure 2.7: Spatial analysis of St Helena Bay area

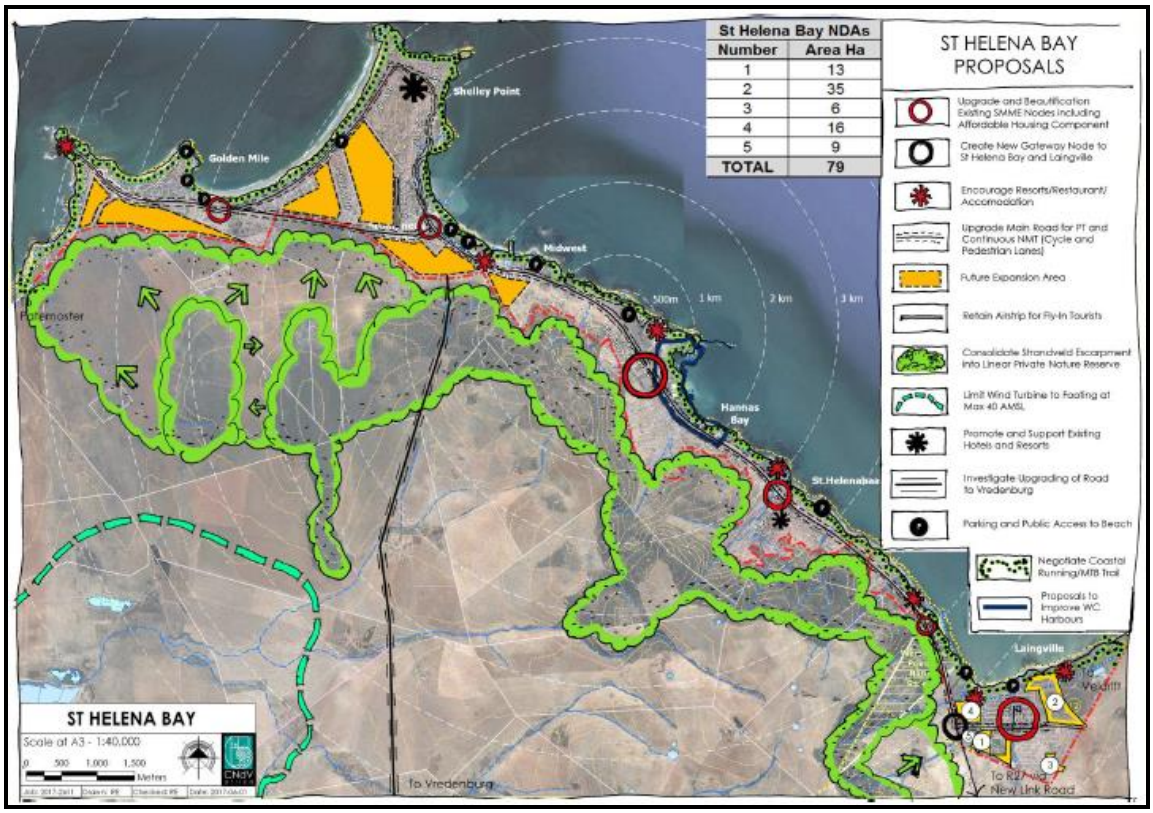

Figure 2.8: Spatial proposals for St Helena Bay area

2.4.6 Saldanha Bay Municipality Local Economic Development (LED) Strategy (2005)

This LED Strategy document was prepared for the Saldanha Bay LM in 2005 by Urban Econ. The following summary is taken from the Executive Summary of the document:

"The purpose of this study was to investigate the options and opportunities available to the local Municipality, so as to broaden the local economic base of the area in order to address the creation of employment opportunities and the resultant spin-off effects throughout the local economy. The Saldanha Bay Municipality (SBM) is faced with a development problem in that the Municipal area jurisdiction is characterised by a mix of urban and rural economies, ranging from relatively strong economic performances to relatively isolated rural settlements with high levels of poverty".

The following key developmental issues of relevance to the WF development proposal were identified:

- "From a regional development perspective, the economy is characterised by a few strong sectors, due to the concentration of leading activities such as agricultural production and manufacturing activities, services and utilities. These are significant sources of employment as well as activities with strong forward and backward linkages, although not all of these are realised locally".

- "Spatially it is evident that the area is characterised by a number of towns, villages and settlements, which places a strain on cost-effective infrastructure and service provision. The economic implications are, amongst others, high levels of unemployment, low levels of disposable income, widespread poverty, etc".
- "The labour force can generally be interpreted as inadequate for sustainable economic development in terms of skills levels, etc. A skills scoping is therefore needed to understand the availability of skills, training needs and requirements from employers".
- "Agriculture and fishing as an important economic production sector and source of employment, commercially as well as a source of subsistence income, needs to be evaluated as a priority sector".
- "The area has specific tourism development potential. Specific examples include the coastal villages, the Langebaan wetlands area and National Park, Nature Reserve, wild flowers and other attractions. These opportunities are not fully exploited and need to be unlocked and appropriately focused on niche markets for full benefit for local communities".

LED is an important tool for the alleviation of poverty and the development of sustainable local economies in that it can:

- Create jobs and new employment opportunities;
- Increase income levels and enable people to pay for services;
- Broaden the tax and revenue base of the local authority;
- Enable the Local Authority to provide more and better services and facilities;
- Enable the Local Authority to concentrate on human resource potential;
- Enable the Local Authority to concentrate on opportunities for development;
- Enable the Local Authority to promote linkages between developed and under-developed areas;
- Enable the Local Authority to build new institutions for sustainable economic development".

Of particular relevance to the WF development proposal, the LED document explicitly discusses the development of renewable energy resources as a viable environmentally sustainable economic sector within the Saldanha Bay LM area (Chapter 7: Economic Development Framework). The following extract is of particular relevance to the study:

"Renewable energy is of high priority in South Africa. In the Saldanha Bay Municipal area, most winds occur during May to September, and November to February. Strong winds of over 20km/h are common in this area (…). This illustrates that the Saldanha Bay Municipal area could be the ideal place to implement wind energy (renewable energy), due to the constant occurrence of wind through the year. A feasibility study should be done in order to take this concept further. The Saldanha Bay Municipality is already involved in various activities, regarding renewable energy, and is also part of the Provincial Task Team that is looking into this issue".

2.4.7 Saldanha Bay Municipality Medium Term Economic Development Strategy (2013)

The Medium Term Economic Development Strategy developed by Stone Soup Development (Pty) Ltd in 2013 notes that Saldanha has the potential and is well

positioned for exponential growth and development. This growth can be expected from four "sunrise" and labour intensive sectors - Oil and Gas, Tourism, Steel Fabrication and Aquaculture. The document notes that Saldanha Bay's importance as a development node comes from its natural and locational comparative advantages and that provide the platform around which four globally competitive and job rich sectors can be built and held in the long term. The most significant of these natural advantages are:

- Best deep water harbour on the African Continent; and;
- Close proximity to Cape Town,

The existing steel manufacturing capability of the area also provides a distinct advantage to developing a potential metal fabrication sector. Additionally the more generic, but nonetheless significant factors driving the development agenda were identified as the efficient stable municipality, existing infrastructure and the availability of labour. At the same time there are significant concern regarding the availability of necessary skills to meet current industry needs let alone the demands for the future.

Tourism is already well established and relatively mature although, it still does have growth potential. Aquaculture is also an established sector that has considerable growth potential. Of relevance to the proposed development there is no reference to renewable energy in the Medium Term Strategy.

2.5 OVERVIEW OF RENEWABLE ENERGY SECTOR IN SOUTH AFRICA

The section below provides an overview of the potential benefits associated with the renewable energy sector in South Africa. Given that South Africa supports the development of renewable energy at national level, the intention is not to provide a critical review of renewable energy. The focus is therefore on the contribution of renewable energy, specifically in terms of supporting economic development.

The following documents were reviewed:

- Independent Power Producers Procurement Programme (IPPPP): An Overview (30 September 2016), Department of Energy, National Treasury and DBSA;
- Green Jobs Study (2011), IDC, DBSA Ltd and TIPS;
- Powering the Future: Renewable Energy Roll-out in South Africa (2013), Greenpeace South Africa;
- WWF SA, Renewable Energy Vision 2030, South Africa, 2014
- Jacqueline M. Borel-Saladin, Ivan N. Turok, (2013). The impact of the green economy on jobs in South Africa,), South African Journal of Science, *Volume 109 |Number 9/10, September/October 2013;*
- The potential for local community benefits from wind farms in South Africa, Louise Tait (2012), Master's Thesis, Energy Research Centre University of Cape Town
- Market Intelligence Report: Renewable Energy (2014). Mike Mulcahy, Greencape.

2.5.1 Independent Power Producers Procurement Programme (IPPPP): An Overview

The document presents an overview of the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) undertaken by the Department of Energy, National Treasury and the Development Bank of South Africa in September 2016. By the end of September 2016, the REIPPPP had made the following significant impacts:

Energy supply
In terms of renewable energy 6 376 MW1 of electricity had been procured from 102 RE Independent Power Producers (IPPs) in six bid rounds to date. Of this 2 738 MW of electricity generation capacity from 51 IPP projects has been connected to the national grid. To date 11 064 GWh of energy has been generated by renewable energy sources procured under the REIPPPP since the first project became operational (making a 15% contribution to morning and evening system peak periods).

Investment
The document notes that the REIPPPP has attracted significant investment in the development of the REIPPs into the country. The total investment (total project costs), including interest during construction, of projects under construction and projects in the process of closure is R194.1 billion (this includes total debt and equity of R192.9 billion, as well as early revenue and VAT facility of R1.3 billion).

The REIPPPP has attracted R53.4 billion in foreign investment and financing in the six bid windows (BW1 – BW4 and 1S2). This is more than double the inward FDI attracted into South Africa during 2015 (R22.6 billion).

South African citizen shareholding
In terms of local equity shareholding, 47% (R31.5 billion) of the total equity shareholding (R66.7 billion) was held by South African's across BW1 to BW4 and BW1S2. This equates to substantially more than the 40% requirement. Foreign equity amounts to R35.2 billion and contributes 53% of total equity.

The REIPPPP also contributes to Broad Based Black Economic Empowerment and the creation of black industrialists. In this regard Black South Africans own, on average, 31% of projects that have reached financial close, which is slightly above the 30% target.

The REIPPPP has also ensured that black people in local communities have ownership in the IPP projects that operate in or nearby their vicinities. On average, black local communities own 11% of projects that have reached financial close. This is well above the 5% target. In addition, an average of 18% shareholding by black people in engineering, procurement and construction (EPC) contractors has been attained in projects that have reached financial close under the REIPPPP. This is slightly below the 20% target. The shareholding by black people in operating companies of IPPs has averaged 19% (against a targeted 20%) for the 47 projects in operation. The target for shareholding by black people in top management has been set at 40%, with an average 61% achieved to date.

Community shareholding and community trusts

The regulations require a minimum ownership of 2.5% by local communities in IPP projects as a procurement condition. This is to ensure that a substantial portion of the investments has been structured and secured as local community equity. An individual community's dividends earned will depend on the terms of each transaction corresponding with the relevant equity share. To date all shareholding for local communities have been structured through the establishment of community trusts. For projects in BW1 to BW4 and 1S2, qualifying communities will receive R29.2 billion net income over the life of the projects (20 years). The report notes that the bulk of the money will however only start flowing into the communities from 2028 due to repayment obligations in the preceding years (repayment obligations are mostly to development funding institutions). However, despite the delay this represents a significant injection of capital into mainly rural areas of South Africa.

Procurement spend

The total projected procurement spend for BW1 to BW4 and 1S2 during the construction phase was R73 billion, more than the projected operations procurement spend over the 20 years operational life (R70 billion). The combined (construction and operations) procurement value is projected as R142.9 billion of which R44.3 billion has been spent to date. For construction, of the R41.8 billion already spent to date, R32.5 billion is from the 51 projects which have already been completed. These 51 projects had planned to spend R30.1 billion. The actual procurement construction costs have therefore exceeded the planned costs by 8% for completed projects.

The majority of the procurement spend to date has been for construction purposes. Of the R41.8 billion spent on procurement during construction, R37.2 billion has reportedly been procured from BBBEE suppliers, achieving 89% of total procured. Actual BBBEE spend during construction for BW1 and BW2 alone was R25.5 billion. The R37.2 billion spent on BBBEE during construction already exceeded the R33.9 billion that had originally been anticipated by IPPs.

Local Content[18]

The report notes that the REIPPP programme represents the country's most comprehensive strategy to date in achieving the transition to a greener economy. Local content minimum thresholds and targets were set higher for each subsequent bid window. The report notes that for a programme of this magnitude, with construction procurement spend alone estimated at R73 billion, the result is a substantial stimulus for establishing local manufacturing capacity. Actual local content spend reported for IPPs that have started construction amounts to R33.8 billion against a corresponding project value (as realised to date) of R66.6 billion. This means 51% of the project value has been locally procured, exceeding the 45% commitment from IPPs and the thresholds for BW1 – BW4.

The report also notes that the strategy has prompted several technology and component manufacturers to establish local manufacturing facilities. The report also notes that this will improve with greater certainty relating to subsequent bid windows and further determinations will continue to build on these successes.

Leveraging employment opportunities

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

To date, a total of 28 4842 job years[19] have been created for South African citizens, of which 26 207 were in construction and 2 276 in operations. These job years should rise further past the planned target as more projects enter the construction phase. The report also notes that by end September 2016, 51 projects had successfully completed construction and moved into operation. The projects had planned to deliver 13 069 job years during the construction phase, but had achieved 20 987. This was 61% more than planned.

The report notes that employment thresholds and targets were consistently exceeded across the entire portfolio. The average share of South African citizens of total South Africa based employees for BW1 – BW3.51&2 was 89% during construction (against a target of 80%), while it was 96% during operations for BW1 – BW2 (against a target of 80%). The report notes that the construction phase offers a high number of opportunities over shorter durations, while the operations phase requires fewer people, but over an extended operating period.

In terms of benefits for local communities, significantly more people from local communities were employed during construction than was initially planned. The expectation for local community participation was 6 771 job years. To date 15 215 job years have been realised (i.e. 125% greater than initially planned), with 13 projects, which have reached financial close, still to reach COD. The number of black SA citizens employed during construction also exceeded the planned numbers by 65%.

Black South African citizens, youths and rural or local communities have been the major beneficiaries during the construction phases, as they respectively represent 80%, 41% and 52% of total job opportunities created by IPPs to date. However, woman and disabled people could still be significantly empowered as they represent a mere 8% and 0.5% of total jobs created to date, respectively.

The share of black citizens employed during construction (80%) and the early stages of operations (82%) has significantly exceeded the 50% target and the 30% minimum threshold. Likewise, the share of skilled black citizens (as a percentage of skilled employees) for both construction and operations has also exceeded the 30% target and is at least 3.5 times more than the minimum threshold of 18%. The share of local community members as a share of SA-based employees was 52% and 68% for construction and operations respectively – at least 4 times more than the minimum threshold of 12% and more than 2.5 times more than the target of 20%.

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

Socio-economic development (SED) contributions
An important focus of the REIPPPP is to ensure that the build programme secures sustainable value for the country and enables local communities to benefit directly from the investments attracted into the area. In this regard IPPs are required to contribute a percentage of projected revenues accrued over the 20 year project operational life toward SED initiatives. These contributions accrue over the 20 year project operation life and are used to invest in housing and infrastructure as well as healthcare, education and skills development. The minimum compliance threshold for SED contributions is 1% of the revenue with 1.5% the targeted level over the 20 year project operational life. The 51 projects that are currently operational have contributed R256 million to SED to date, which represents approximately 1.2% of total revenue generated to date. The 51 IPP projects have also committed 1.5% over the 20 year project operational life. Therefore, based on current projects average commitment level is 2.2% or 120% more than the minimum compliance threshold. To date (across 6 bid windows) a total contribution of R19.3 billion has been committed to SED initiatives. Assuming an even, annual revenue spread, the average contribution per year would be R964 million. Of the total commitment, R15.2 billion is specifically allocated for local communities where the IPPs operate. With every new IPP on the grid, revenues and the respective SED contributions will increase.

Enterprise development contributions
The target for IPPs to spend on enterprise development is 0.6% of revenues over the 20 year project operational life. However, for the current portfolio, IPPs have committed an average of 0.7% or 14% more than the target. Enterprise development contributions committed for BW1 to BW4 and 1S2 amount to R6 billion. Again, assuming an equal distribution of revenue over the 20 year project operational life, enterprise development contributions would be R301 million per annum.

Of the total commitment, R4.5 billion is specifically committed directly within the local communities where the IPPs operate, contributing significantly to local enterprise development. To date a total contribution of R70.4 million has already been made to the local communities (i.e. 88% of the total R80.5 million enterprise development contributions made to date).

2.5.2 Green Jobs Study

The study notes that South Africa has one of the most carbon-intensive economies in the world, therefore making the greening of the electricity mix a national imperative. Within this context the study notes that the green economy could be an extremely important trigger and lever for enhancing a country's growth potential and redirecting its development trajectory in the 21st century. The attractiveness of wind and solar technologies is not only supported by local conditions, but also by the relatively mature stage of their technological development.

The aim of the Green Jobs study was to provide information on the net direct job creation anticipated to emerge in the formal economy across a wide range of technologies/activities that may be classified as green or contributing to the greening of the economy. The study looked at the employment potential for a number of green sectors, including power generation, over three consecutive timeframes, namely, the short term (2011 – 12), medium term (2013 – 17) and long term (2018

– 25). The analysis attempts to estimate the employment potential associated with: building, construction and installation activities; operations and maintenance services; as well as the possible localisation spin-offs for the manufacturing sector as the domestic production of equipment, parts and components benefits from preferential local procurement.

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

The analysis reveals the potential of an unfolding green economy to lead to the creation of approximately 98 000 new direct jobs, on average, in the short term, almost 255 000 in the medium term and around 462 000 employment opportunities in the formal economy in the long term. The number of jobs linked to the power generation was estimated to be ~ 12 500 in the short term, 57 500 in the medium term and 130 000 in the long term. Power generation jobs therefore account for 28% of the employment opportunities created in the long term. However, the report notes that the contribution made by a progressively expanding green energy generation segment increases from 14% of the total in the short term, or just over 13 500 jobs, to more than 28% in the long term (166 400) (Table 2.1).

The study also found that energy generation is expected to become an increasingly important contributor to green job creation over time, as projects are constructed or commissioned.

The international wind power industry employed almost half a million workers worldwide in 2009 – a figure that is expected to grow to over a million in five years from now, according to forecasts by the Global Wind Energy Council.

Table 2.1: Net direct employment potential estimated for the four broad types of activity and their respective segments in the long term, and an indication of the roll-out over the three timeframes

Broad green economy category		Segment	Technology/product	Total net direct employment potential in the long-term	Net direct manufacturing employment potential in the long-term	Total net direct employment potential (ST, MT, LT)	Net direct manufacturing employment potential (ST, MT, LT)
ENERGY GENERATION	Renewable (non-fuel) electricity	Wind power	Onshore wind power	5 156	2 105	VL, L, M	L, M, H
			Offshore wind power				
		Solar power	Concentrated solar power	3 014	608	N, VL, M	N, VL, M
			Photovoltaic power	13 541	8 463	M, H, H	H, VH, VH
		Marine power	Marine power	197	0	N, N, VL	N, N, N
		Hydro power	Large hydro power	272	111	VL, VL, VL	VL, M, VL
			Micro-/small-hydro power	100	0	VL, VL, VL	N, N, N
	Fuel-based renewable electricity	Waste-to-energy	Landfills	1 178	180	VL, VL, L	VL, VL, L
			Biomass combustion	37 270	154	VL, H, VH	VL, VL, L
			Anaerobic digestion	1 429	591	VL, VL, L	VL, L, M
			Pyrolysis/Gasification	4 348	2 663	VL, L, M	VL, H, H
			Co-generation	10 789	1 050	L, M, H	M, H, H
	Liquid fuel	Bio-fuels	Bio-ethanol	52 729	6 641	M, H, VH	L, H, VH
			Bio-diesel				
ENERGY GENERATION SUB-TOTAL				**130 023**	**22 566**		
ENERGY & RESOURCE EFFICIENCY		Green buildings	Insulation, lighting, windows	7 340	838	L, M, M	L, M, M
			Solar water heaters	17 621	1 225	L, H, H	L, M, H
			Rain water harvesting	1 275	181	VL, VL, L	VL, VL, L
		Transportation	Bus Rapid Transport	41 641	350	VH, VH, VH	H, M, L
		Industrial	Energy efficient motors	-566	4	VL, VL, VL	VL, VL, VL
			Mechanical insulation	666	89	VL, VL, VL	VL, VL, VL
ENERGY & RESOURCE EFFICIENCY SUB-TOTAL				**67 977**	**2 686**		
EMMISIONS AND POLLUTION MITIGATION		Pollution control	Air pollution control	900	166	N, VL, VL	N, L, L
			Electrical vehicles	11 428	10 642	VL, L, H	N, H, VH
			Clean stoves	2 783	973	VL, VL, L	VL, L, M
			Acid mine water treatment	361	0	VL, VL, VL	N, N, N
		Carbon Capture and Storage		251	0	N, VL, VL	N, N, N
		Recycling		15 918	9 016	M, H, H	H, VH, VH
EMMISIONS AND POLLUTION MITIGATION SUB-TOTAL				**31 641**	**20 797**		
NATURAL RESOURCE MANAGEMENT		Biodiversity conservation & eco-system restoration		121 553	0	H, VH, VH	N, N, N
		Soil & land management		111 373	0	VH, VH, VH	N, N, N
NATURAL RESOURCE MANAGEMENT SUB-TOTAL				**232 926**	**0**		
TOTAL				**462 567**	**46 049**		

Notes:

- VH = very high (total employment potential > 20 000 direct jobs; manufacturing employment potential > 3 000 direct jobs);
- H = high (total employment potential > 8 000 but < 20 000; manufacturing employment potential > 1 000 but < 3 000);
- M = medium (total employment potential > 3 000 but < 8 000; manufacturing employment potential > 500 but < 1 000);
- L = low (total employment potential > 1 000 but < 3 000; manufacturing employment potential > 150 but < 500);
- VL = very low (total employment potential > 0 but < 1 000; manufacturing employment potential > 0 but < 150);
- N = negligible/none (total employment potential = 0; manufacturing employment potential = 0).

Of relevance the study also notes that the largest gains are likely to be associated with operations and maintenance (O&M) activities, particularly those involved in the various natural resource management initiatives. In this regard, operations and maintenance employment linked to renewable energy generation plants will also be substantial in the longer term. The employment growth momentum related to building, construction and installation activities peaks in the medium term, largely propelled by mass transportation infrastructure, stabilising thereafter as green building methods become progressively entrenched.

In addition, as projects related to a greening economy are progressively commissioned, the potential for local manufacturing also become increasingly viable. Employment gains in manufacturing are also expected to be relatively more stable than construction activities, since the sector should continue exhibiting growth potential as new and replacement components are produced, as additional markets are penetrated and as new green technologies are introduced. Manufacturing segments with high employment potential in the long term would include suppliers of components for wind farms. The study does note that a shortage of skills in certain professional fields pertinent to wind power generation presents a challenge that must be overcome.

The study also found that South Africa is in a position to leverage upon some of its existing manufacturing capacities in order to produce components and parts for various sections of wind turbines, especially those industries involved in the production of steel and metal products, as well as the boat building and electrical industries. Local manufacturing capacity can be promoted through engagement with established global manufacturers. The study does however note that critical mass would have to be developed in order to obtain economies of scale.

The study found that there was also significant potential for local involvement in the wind sector (Table 2.2). Local companies can also exploit market opportunities in other African countries with higher wind power potential. This would create additional opportunities for improving economies of scale and enhancing the local industry's chances to succeed.

Table 2.2: Potential contribution capacity of local industries

Industry	Product/services	Share in turbine cost[30]	Local capacity
Manufacturing:	**Production of:**		
Structural steel, cast iron, metal and cement products	Towers, frames, hubs	34%	High
Boat-, airplane-, glass fibre composites	Rotor blades, nacelle, other plastic and fibre glass products	26%	High
High-technology parts and machinery	Gearbox parts, shafts, bearings	18%	Low
Electrical and electronic equipment	Generators, transformers and other electrical components	15%	Medium
Metal products	Pitch, yaw and break systems, and other parts	7%	Medium
Construction and civil engineering	**Foundation laying, tower erection, housing**	-	High
Electricity distribution	**Grid connection**	-	High
Electricity generation	**Operations and maintenance**	-	High
Logistics	**Transportation of very large components**	-	Medium

The study also identifies a number of advantages associated with wind power as a source of renewable energy with a large 'technical' generation potential. In this regard wind energy does not emit carbon dioxide (CO_2) in generating electricity and is associated with exceptionally low lifecycle emissions. The construction period for a wind farm is much shorter than that of conventional power stations, while an income stream may in certain instances be provided to local communities through employment and land rental. The study also notes that the greenhouse gases (GHG) associated with the construction phase are offset within a very short period of time compared with the project's lifespan. Wind power therefore provides an ideal means for reaching emission reduction targets in a relatively easy manner. In addition, and of specific relevance to South Africa, wind as an energy source is not dependent on water (as compared to the massive water requirements of conventional power stations), has a limited footprint and therefore does not impact on large tracts of land, poses limited pollution and health risks, specifically when compared to coal and nuclear energy plants.

Of relevance, the study also notes that the case for wind power is enhanced by the positive effect on rural or regional development. Wind farms located in rural areas create an opportunity to benefit the local and regional economy through the creation of jobs and tax revenues. In Denmark, one of the world's most advanced countries with respect to wind power generation, a significant portion of wind turbines are owned by local communities. A major drawback for wind energy is that, due to the natural variation in wind power on a daily and/or seasonal basis, back-up base-load generation capacity is imperative to provide stability to the energy supply. Furthermore, as with other renewable energy sources, wind power has relied on incentive measures throughout the world for its development, although its relative competitiveness has been improving continuously.

2.5.3 Powering the Future: Renewable Energy Roll-out in South Africa

The study notes that South Africa has higher CO_2 emissions per GDPppp (2002 figures) from energy and cement production than China or the USA (Letete, T et al). Energy accounts for 83% of the total GHG emissions (excluding land use, land use change and forestry) with fuel combustion in the energy industry accounting for 65% of the energy emissions of South Africa (DEA, 2011).

Within a broader context of climate change, coal energy does not only have environmental impacts, it also has socio-economic impacts. Acid mine drainage from abandoned mines in South Africa impacts on water quality and poses the biggest threat to the country's limited water resources. Huge volumes of water are also required to wash coal and cool operating power stations. Eskom uses an estimated 10 000 litres of water per second due to its dependency on coal (Greenpeace, 2012).

The report notes that the concerns relating to whether South Africa can afford renewable energy arise out of the perception that renewable energy (RE) is expensive while fossil and nuclear technologies are cheap. The premise also ignores life cycle costing of the technologies which is favourable to renewable technologies where the sources of fuel are free or cheap.

In terms of costs, onshore wind energy costs are expected to drop by 12% since 2011 due to lower cost equipment and gains in output efficiency. The report refers to Bloomberg New Energy Finance, which noted that the average wind farm could reach grid parity by 2016. In Australia, unsubsidised renewable energy is now cheaper than electricity from new-build coal- and gas-fired power stations. A BNEF study indicated that electricity can be supplied from a new wind farm at a cost of R747.32/MWh (AUS$80), compared to R1 335.82/MWh (AUS$143) from a new coal plant or R1 083.06 /MWh (AUS$116) from a new base-load gas plant, including the cost of emissions under the Australian government's carbon pricing scheme. Based on this the chief executive of Bloomberg New Energy Finance, Michael Liebreich, noted that "The fact that wind power is now cheaper than coal and gas in a country with some of the world's best fossil fuel resources showing that clean energy is a game changer which promises to turn the economics of power systems on its head," (Paton, 2013).

Within the South African context, a presentation by the South African Wind Energy Association (SAWEA) at the NERSA hearings in February 2013 indicated that in the second round of (REIPPPP) the bidding price for wind was 89c/kWh. The estimates for nominal new Eskom coal power range from NERSA's 97c/kWh to Standard Bank's estimate that Kusile will cost R1.38/kWh in 2019. In addition to being more expensive, coal-fired power stations have fewer job creation possibilities than RE, carry future expenses due to climate change impacts, and have health expense issues due to pollution.

The Greenpeace study notes that it is not only local manufacturers and rural farmers that benefit from RE, but large scale renewable utilities as well. The report notes that the Lake Turkana Wind Power Project (LTWP), which has a capacity of 310MW and consists of 365 turbines of 850kW, is the largest wind farm in Sub-Saharan Africa. The project is equivalent to 20% of the current installed capacity in Kenya and is the largest single private investment in Kenya's history (LTWP, 2012). At the proposed 9.9 US cents per kWh it will be the cheapest electricity in Kenya (Kernan,

2012). Wind energy therefore creates significant opportunities for investment and the production of affordable energy without the significant environmental and socio-economic impacts associated with coal and nuclear energy options.

2.5.4 WWF SA, Renewable Energy Vision 2030

In its vision the WWF motivated for a more ambitious plan, suggesting that the IRP should provide for an 11-19% share of electricity capacity by 2030, depending on the country's growth rate over the next fifteen years. The vision is to increase renewable energy at the expense of new coal-fired and nuclear capacity. The report notes that in addition to the obvious environmental benefits of this scenario, it will enable South Africa to add flexibility to energy supply capacity on an on-demand basis.

The report notes that Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) introduced in 2011, has by all accounts been very successful in quickly and efficiently delivering clean energy to the grid. Increasingly competitive bidding rounds have led to substantial price reductions. In this regard the study indicates that in three years, wind and solar PV have reached pricing parity with supply from new coal-fired power stations from a levelised cost of electricity (LCOE) perspective.

In bidding window 3 of August 2013, the average tariffs bid for wind and solar PV were R0,66/kWh and R0.88/kWh respectively, well below the recent estimates of R1.05/kWh for supply from the coal-fired Medupi and Kusile power stations (Papapetrou 2014). In 2013, the average levelised cost of electricity supplied to the grid was R0.82/kWh (Donnelly 2014), so wind-generated power has already achieved pricing parity with the grid.

The report also notes that the REIPPPP has several contracting rounds for new renewables supply. A robust procurement process, extension of a 20-year sovereign guarantee on the power purchase agreement (PPA) and, especially, ideal solar power conditions, have driven the investment case for RE in South Africa. In this regard South Africa has been identified as one of the worlds' leading clean energy investment destinations (Figure 2.9).

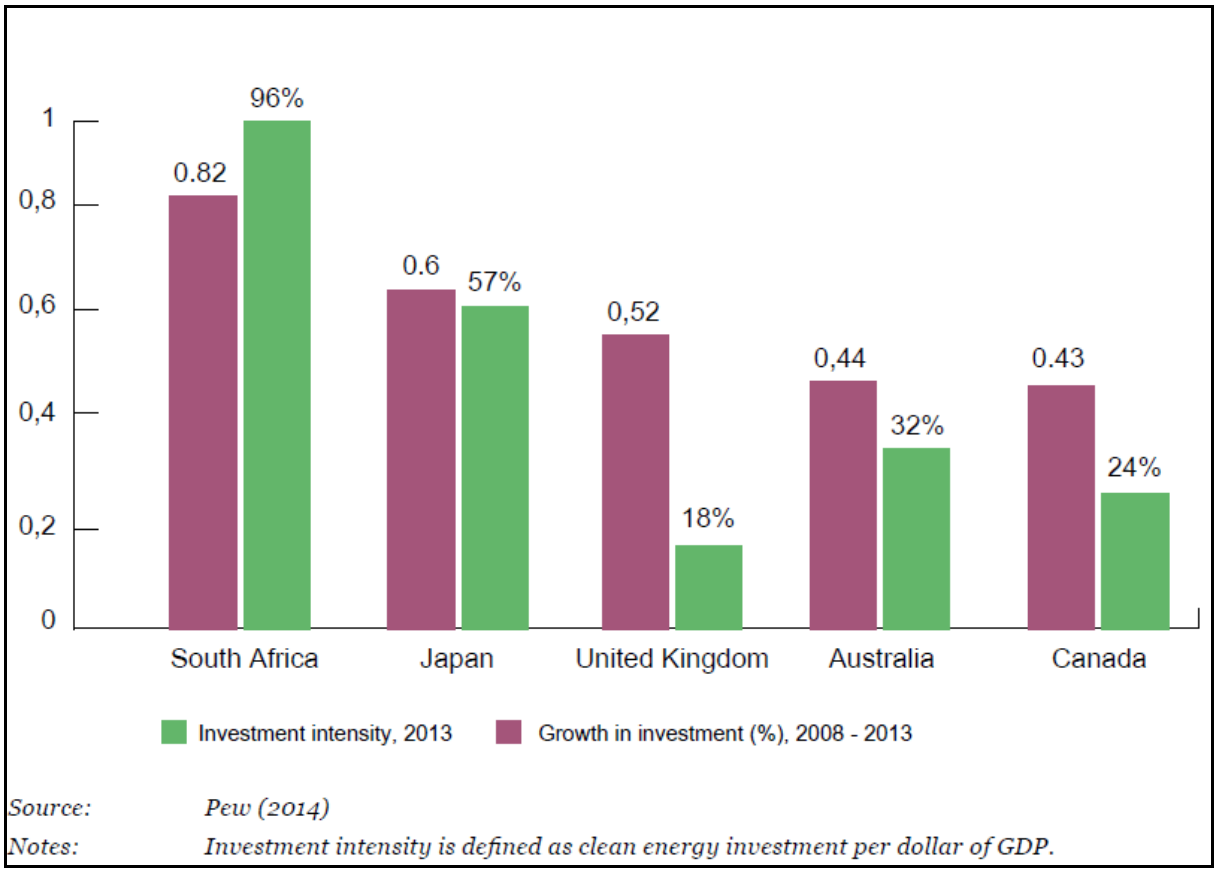

Figure 2.9: South Africa leads as a clean energy investment destination

The study also found that there were a number of opportunities to further reduce the cost of wind energy, specifically cost reductions for turbines. Towers, constructed mostly from steel, comprise 25% of the cost of wind turbines. The increasing distribution of manufacturers, greater competition and the use of more lightweight materials support cost reductions. In addition, since towers can, and are manufactured locally, they will be less sensitive to the weakening Rand. The study estimates a potential cost reduction of 15-20% by 2030. Rotor blades comprise 20% of the cost of wind turbines. On-going improvements in reducing weight through the use of carbon fibre and other lightweight materials will support a reduction of 10-20% by 2020. Gearbox costs and the costs of other components may be reduced by 10-15% by 2020, owing to manufacturing efficiencies.

With regard to local economic development, the REIPPPP sets out various local economic development requirements with stipulated minimum threshold and aspirational targeted levels, which each bidder must comply with. Based on the Broad-Based Black Economic Empowerment Codes, this requirement comprises the following components which make up a scorecard:

- Ownership by black people and local communities;
- Job creation;
- Local content;
- Management control;

- Preferential procurement;
- Enterprise development; and
- Socio-economic development.

The final award is based on a combined evaluation in which price determines 70% of the ranking and performance on the local economic development scorecard the remaining 30%. This gives non-price criteria a much heavier weighting than they would normally enjoy under Government's preferential procurement policy.

Job creation, local content and preferential procurement accounted for the bulk of possible points on the scorecard in REIPPPP Round 3. Consequently, a requirement to source goods and services locally is considered to be the central driver of project costs associated with local economic development. In terms of local content, the definition of local content is quite broad, being the value of sales less the costs associated with imports. However, through successive bidding rounds, the definition has become subject to more detailed definition, with an expanding list of exclusions and increased targeting in terms of key components identified by the Department of Trade and Industry for local manufacturing. This has benefitted local manufacturers and suppliers.

The WWF study considers a low and high growth renewable energy scenario. The capital requirements for the low growth scenario are estimated at R474 billion over the period 2014-2030 (2014 Rand value), rising to R1.084 trillion in the high-growth scenario, in which 35 GW of capacity is built. Each annual round of purchasing 2 200 MW of RE capacity would cost approximately R77 billion in 2014 Rand value terms. In relative economic terms, this equates to 2% of the GDP per annum or approximately one quarter of Government's planned annual investment in infrastructure over the medium term. In the low economic growth scenario, which is arguably the more realistic one, the average annual new liability over the period is approximately R40 billion.

The study also points out that infrastructure spend is more beneficial than other government expenditure due to the infrastructure multiplier effect. This refers to the beneficial impact of infrastructure on economic growth in both the short term, resulting from expansion in aggregate demand, as well as in the longer term (six to eight years) due to enhanced productive capacity in the economy. A recent USA study on highway expenditure revealed the infrastructure multiplier to be a factor of two on average, and greater during economic downturns (Leduc & Wilson 2013). This means that one dollar spent on infrastructure raises GDP by two dollars. If the same were to hold true, as similar analysis suggests it would (Kumo 2012, Ngandu et al 2010), this indicates that the construction of renewable energy plants could be a valuable economic growth driver at a time when fears of recession abound.

The report concludes that the WWF is optimistic that South Africa can achieve a much more promising clean energy future than current plans allow for. With an excellent solar resource and several very good wind-producing pockets, the country is an ideal candidate for a renewable energy revolution.

The report indicates that the levelised cost of producing renewable energy already competes favourably with the three main alternatives, namely coal, gas and nuclear. In addition, renewable energy would contribute to a more climate-resilient future and insulate South Africa from dependence on expensive and unreliable fuel sources

priced in dollars. Critical from a planning perspective, the report notes that renewable energy can also provide added flexibly on an 'as needed' basis, as electricity demand grows. This is vital in a highly uncertain environment.

2.5.5 The impact of the green economy on jobs in South Africa

The paper notes that greening the economy is particularly important in South Africa for two basic reasons: (1) the exceptional level of unemployment that the country is experiencing and (2) the high carbon impact of the economy.

In terms of employment, the paper refers to the IDC *Green Jobs R*eport (2011). In summary, the short-term (next 2 years) estimate of total net employment potential is 98 000 jobs, and the long-term (next 8 years) employment potential is 462 567 jobs. 16 Natural resource management is predicted to lead to the greatest number of these at 232 926 long-term jobs. Green energy generation is estimated to produce 130 023 long-term jobs, with energy and resource efficiency measures adding another 67 977 long-term jobs.

The paper notes that the Green Jobs Report was prepared by 17 primary researchers from three prominent organisations, namely the IDC, the Development Bank of South Africa, and Trade and Industrial Policy Strategies. Many role players from other organisations were also consulted, including the World Wide Fund for Nature, the Green Building Council, the Economic Development Department and private companies involved in green industries.

Despite questions surrounding the employment estimates contained in the Green Jobs Report, green economic activity does appear to generate more local jobs than fossil-fuel-based industries. Some of the estimates also indicate the potential for significant employment. The paper concludes that the figures represent a promising starting point that warrants further research and policy involvement in greening the economy in South Africa.

2.5.6 The potential for local community benefits from wind farms in South Africa

In her thesis, Tait notes that the distributed nature of renewable energy generation can induce a more geographically dispersed pattern of development. As a result RE sites can be highly suited to rural locations with otherwise poor potential to attract local inward investment therefore enabling to target particularly vulnerable areas.

In her conclusion, Tait notes that the thesis has found positive evidence for the establishment of community benefit schemes in the wind sector in South Africa. The BBBEE requirements for developers as set out in the DoE's IPPPP for renewables is the primary driver for such schemes. The procurement programme, in keeping with the objective of maximising the economic development potential from this new sector, includes a specific focus on local communities in which wind farms are located.

The procurement programme, typical of all Government tendering processes, includes a BBBEE scorecard on which wind projects are evaluated. However the renewables scorecard appears to play an important part in a renewed focus on the broad-based Aspects of the legislation, as enforced by a recent national review of the BBBEE Act. In this regard the renewables scorecard includes specifications for local

communities in respect of broad-based ownership schemes, socio--economic development and enterprise development contributions. This approach to legislating social responsibilities of business in all sectors definitely has a South African flavour, borne out of the political history of the country and the imperatives for social transformation laid out in the constitution.

While Tait notes that it is still early days for the development of this sector and one cannot determine the impact that such benefit schemes may have, it is clear though that targeted development expenditure will be directed to multiple rural communities and there seems to be a strong potential to deliver socio-economic benefits.

2.5.7 Market Intelligence Report: Renewable Energy

A study undertaken by Greencape in 2014 found that the bidding programme is placing increasing pressure on developers to include locally manufactured 'key components'. In the wind sector the key components that are being focussed on are wind turbine blades and towers. In this regard two tower manufacturers had at the time begun the establish facilities in South Africa, DCD in Coega, and Gestamp in Atlantis. LM wind power has also announced that they have developed business cases for two regions in South Africa. In the PV industry the focus has been on panels, inverters, mounting structures, cables and trackers. There is already considerable manufacturing set up in the Western Cape to support the PV industry, including SunPower, Jinko, SolarDirect, ZnShine (pending) (Modules) and AEG, SMA, Gefran, and MLT-Drives (Inverters). The report notes that these manufacturers could supply a significant portion of the South African market. The increasing local content requirements are leading to increasing interest in setting up manufacturing in the country, specifically in the Western Cape.

The study also notes that the Western Cape is home to the bulk of the renewable energy industry in South Africa. The majority of 'successful' developers are in Cape Town. The majority of professional services, the majority of EPC companies, and the majority of manufactures are based in the province. The Western Cape has also launched a broader Green Economy strategy, which focuses on enshrining the green economy principles in a transversal strategic framework. As part of the strategy the City of Cape Town has made a large area of industrial land available for the manufacturing of renewable energy components. This opportunity is perfect for manufacturers who are interested in green field sites. The DTi in collaboration with GreenCape will be establishing a special economic zone (SEZ) in Atlantis focussed on Green technology manufacturing (Atlantis Green Economic Hub). The zone will offer significant incentives for investment, including proposed 15% company tax rate.

2.6 INTERNATIONAL EXPERIENCE WITH WIND FARMS

Three documents were reviewed, namely:

- National Wind Farm Development Guidelines produced by the Environment Protection and Heritage Council (EPHC) of Australia (Draft, July, 2010). The guidelines highlight the potential social and biophysical impacts associated with WFs. Given the similarities between South Africa and Australia, such as large, unobstructed landscapes and climates, these guidelines are regarded as relevant to the South Africa situation;

- Research on wind energy development in Scotland undertaken by Warren and Birnie in 2009 (Warren, Charles R. and Birnie, Richard V.(2009) 'Re-powering Scotland: Wind Farms and the 'Energy or Environment?' Debate'). The Scottish experience is also regarded as relevant to the South Africa context for a number of reasons. Firstly, installed wind power capacity has expanded rapidly in Scotland over the past decade. Before 1995 no wind farms existed. By late 2008, there were 59 operational onshore wind farms, 65 consented to or under construction and a further 103 in the planning process (BWEA, 2008). South Africa faces a similar situation, with a rush of applicants seeking approval for WFs. Secondly, the impact on the landscape, specifically the Scottish Highlands, was one of the key concerns raised in Scotland. The impact on undeveloped, natural landscapes is also likely to become an issue of growing concern in South Africa;
- Review of the potential health impacts associated with wind farms undertaken by the Australian Health and Medical Research Council (July, 2010)[20].

It should be noted that the section is not specific to the site but merely a review of international literature.

Health related impacts

The potential health impacts typically associated with WFs include, noise, dust shadow flicker and electromagnetic radiation. The findings of a literature review undertaken by the Australian Health and Medical Research Council published in July 2010 indicate that there is no evidence of wind farms posing a threat to human health. The research also found that wind energy is associated with fewer health effects than other forms of traditional energy generation, and may therefore in fact result in the minimisation of adverse health impacts for the population as a whole (WHO, 2004).

The overall conclusion of the review undertaken by the Australian Health and Medical Research Council (July, 2010) is that, based on current evidence, wind turbines do not pose a threat to health if planning guidelines are followed.

Landscape impacts

The guidelines also note that landscapes change over time, both naturally and through human intervention. In addition, landscape values, being subjective, change not only with time, but also from person to person. As a result there are a wide variety of opinions of what is valued and what is not. The perceptions by which we value landscapes are influenced by a range of factors such as visual, cultural, spiritual, environmental, and based on memories or different aesthetics (National Wind Farm Development Guidelines, DRAFT - July 2010).

The guidelines 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 at a time, but if each successive stretch of the road is dominated by views of a wind farm, then that can be argued to be a cumulative visual impact (National Wind Farm Development Guidelines, DRAFT - July 2010).

[20] Annexure D contains a more detailed review of the documents

Cumulative impacts may be visual and aesthetic, but they can also occur in relation to non-visual values in the landscape. Non-visual values include sounds/noise, associations, memories, knowledge and experiences or other cultural or natural values. As an example, the Guidelines indicate that locating four wind farms in a valley previously best known for its historic wineries might change the balance of perception about the valley's associational character, irrespective of whether all four wind farms were sited in a single view shed (National Wind Farm Development Guidelines, DRAFT - July 2010).

In the Scottish case, the primary argument employed to oppose wind farms related to the impact on valued landscapes. As in the South African case, the visual impacts are exacerbated by the fact that the locations with the greatest wind resources are often precisely those exposed upland areas which are most valued for their scenic qualities, and which are often ecologically sensitive. The establishment of wind farms together with the associated service roads and infrastructure, transforms landscapes which are perceived to be natural into 'landscapes of power' (Pasqualetti et al., 2002, p. 3).

2.7 IMPACT OF WIND FARMS ON TOURISM

A review of international literature in the impact of wind farms was undertaken as part of the SIA. Three articles were reviewed, namely:

- Atchison, (April, 2012). Tourism Impact of Wind Farms: Submitted to Renewables Inquiry Scottish Government. University of Edinburgh
- Glasgow Caledonian University (2008). The economic impacts of wind farms on Scottish tourism. A report prepared for the Scottish Government
- Regeneris Consulting (2014). Study into the Potential Economic Impact of Wind Farms and Associated Grid Infrastructure on the Welsh Tourism Sector

The most comprehensive appears to be a review undertaken by Professor Cara Aitchison from the University of Edinburgh in 2012 which formed part Renewable Energy Inquiry by Scottish Government. The research by Aitchison found that previous research from other areas of the UK has demonstrated that wind farms are very unlikely to have any adverse impact on tourist numbers (volume), tourist expenditure (value) or tourism experience (satisfaction) (Glasgow Caledonian University, 2008; University of the West of England, 2004). In addition, to date, there is no evidence to demonstrate that any wind farm development in the UK or overseas has resulted in any adverse impact on tourism. In conclusion, the findings from both primary and secondary research relating to the actual and potential tourism impact of wind farms indicate that there will be neither an overall decline in the number of tourists visiting an area nor any overall financial loss in tourism-related earnings as a result of a wind farm development. The study by the Glasgow Caledonian University (2008) found that only a negligible fraction of tourists will change their decision whether to return to Scotland as a whole because they have seen a wind farm during their visit.

The study also found that 51.0% of respondents indicated that they thought wind farms could be tourist attractions. In this regard the visitor centre at the Whitelee Wind Farm in east Ayrshire Scotland run by ScottishPower Renewables has become

one of the most popular 'eco-attractions' in Scotland, receiving 200 000 visitors since it opened in 2009.

2.8 IMPACT ON WIND FARMS ON PROPERTY VALUES

The literature review undertaken as part of the SIA does not constitute a property evaluation study and merely seeks to comment on the potential impact of wind farms on property values based on the findings of studies undertaken overseas. The literature reviewed was based on an attempt by the authors of the SIA to identify what appear to be "scientifically" based studies that have been undertaken by reputable institutions. In this regard it is apparent that there are a number of articles available on the internet relating to the impact of wind farms on property values that lack scientific vigour. The literature review also sought to identify research undertaken since 2010. The literature review does not represent an exhaustive review.

In total five articles were identified and reviewed namely:

- Stephen Gibbons (April, 2014): Gone with the wind: Valuing the Visual Impacts of Wind turbines through house prices. London School of Economics and Political Sciences & Spatial Economics Research Centre, SERC Discussion Paper 159;
- Review of the Impact of Wind Farms on Property Values, Urbis Pty Ltd (2016): Commissioned by the Office of Environment and Heritage, NSW, Australia;
- Yasin Sunak and Reinhard Madlener (May 2012): The Impact of Wind Farms on Property Values: A Geographically Weighted Hedonic Pricing. School of Business and Economics / E.ON Energy Research Center, RWTH Aachen University. Model Working Paper No. 3/2012;
- Martin D. Heintzelman and Carrie M. Tuttle (March 3, 2011): Values in the Wind: A Hedonic Analysis of Wind Power Facilities. Economics and Financial Studies School of Business, Clarkson University;
- Ben Hoen, Jason P. Brown, Thomas Jackson, Ryan Wiser, Mark Thayer and Peter Cappers (August 2013): A Spatial Hedonic Analysis of the Effects of Wind Energy Facilities on Surrounding Property Values in the United States. Ernest Orlando Lawrence Berkeley National Laboratory.

Three of the articles indicate that wind farms have the potential to impact on property values, while two indicate that the impacts are negligible and or non-existent.

In terms of the proposed project the most relevant study is the Urbis study (2016). The authors of the study found that appropriately located wind farms within rural areas, removed from higher density residential areas, are unlikely to have a measurable negative impact on surrounding land values.

SECTION 3: OVERVIEW OF THE STUDY AREA

3.1 INTRODUCTION

Section 3 provides an overview of the study area with regard to:

- The administrative context;
- The socio-economic context of the study area.

3.2 ADMINISTRATIVE CONTEXT

The proposed WF is located within the Saldanha Bay LM (WC014), a Category-B Municipality[21], which is one of five LM that make up the West Coast District Municipality (WCDM) (DC1), a Category-C municipality, within the Western Cape Province. The SBLM is bordered in the west by the Atlantic Ocean, in the south by the West Coast National Park (which forms part of the West Coast District Management Area), in the north by the Bergrivier LM (WCDM), and the east by the Swartland LM (WCDM).

The administrative seat of the SBLM is Vredenburg. The most significant settlements in the SBLM are Vredenburg, Saldanha, Langebaan, St Helena Bay and Hopefield. Saldanha Harbour, the largest harbour on the west coast of the African continent and is of regional and national importance. A number of large manufacturing plants (e.g. Saldanha Steel) are located in the Saldana area. The bulk of the SBLM's population is concentrated in urban areas, mainly Vredenburg and Saldanha. Other, smaller settlements include Paternoster, Jacobsbaai, Langebaan and St Helena Bay (Figure 3.1).

[21] 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

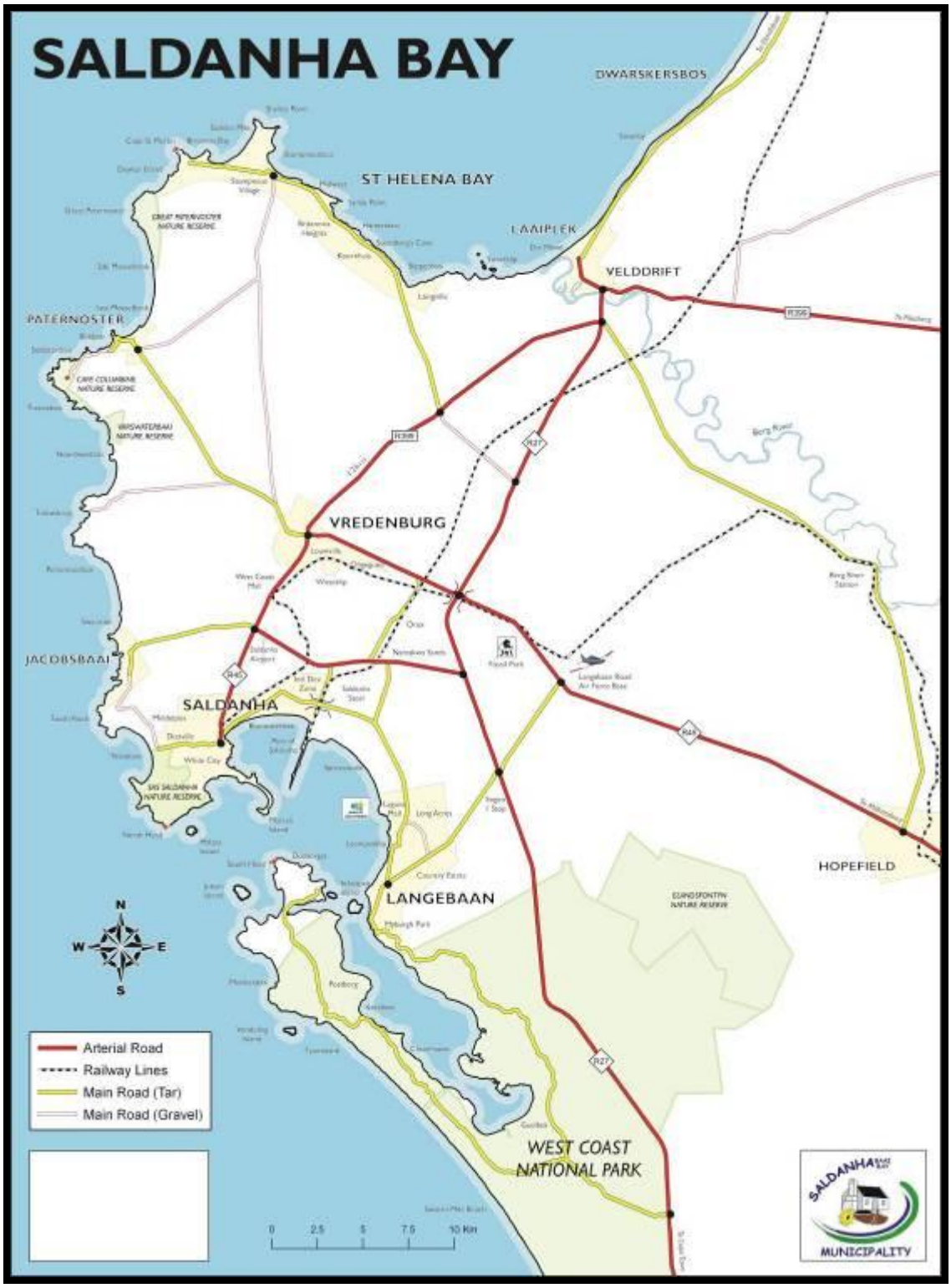

Figure 3.1: Major settlements and roads within the Saldanha Bay LM (*Source: Saldanha Bay Tourism)*

3.3 SOCIO-ECONOMIC OVERVIEW OF THE STUDY AREA

3.3.1 Introduction

The largest towns in the Saldanha Bay Municipality are Saldanha and Vredenburg located approximately 20 and 35 km south of Britannica Bay/ St Helena Bay respectively (Figure 3.1). Saldanha serves as an important fishing and industrial port, while Vredenburg serves as the business and administrative centre of the Saldanha Bay LM. Vredenburg is located approximately 130 km north of Cape Town. Both Saldanha and Vredenburg are easily accessible from the R27 coastal road, which links Cape Town in the south with Velddrif (Bergrivier LM) in the north.

In terms of natural assets the Saldanha Bay municipal area boasts a broad range of natural assets that contribute to the area's attraction as a tourist destination. These assets include the Langebaan Lagoon, a Ramsar site and popular recreational areas, as well as the major portion of the West Coast National Park, the Cape Columbine Nature Reserve (Paternoster) and the West Coast Fossil Park (Langebaanweg). Other major tourism attractions include the region's famed wild flower displays (late August to mid-October), as well as whale, dolphin and bird watching opportunities. The coastline is also extensively used for recreational uses such as angling, crayfishing and various water sports. The areas tourism potential is enhanced by its proximity to Cape Town and other large towns in the Boland (Stellenbosch, Paarl, Wellington).

Commercial fishing and fish processing have played an important historic role within the local economies of coastal towns such as Saldanha and St Helena Bay. However, a decline in fish stock and other factors has, over the past two to three decades, resulted in a shift towards tourism. As part of this change a large number of holiday and retirement homes have been established in the area, specifically in towns such as Langebaan, Paternoster, Jakobsbaai, and the Britannica Bay/ St Helena Bay area. As a result the traditional fishing village sense of place associated with these small, coastal towns has largely been lost.

The population of Saldanha Bay Municipality was 99 193 in 2011 or 25 % of the West Coast District population (391 766 in 2011). Of the local municipalities in the district, Saldanha Bay (25%) and Swartland (29%) had the largest populations in 2011 (Census 2011).

Between 2001 and 2011 the population of the Saldanha Bay LM increased from 70 261 to 99 193, at an average annual growth rate of 2.6%. The population is expected to grow at an annual average rate of 3.45% a year. The population growth can be attributed largely to the development of the Port of Saldanha and the associated industrial zone. The Saldanha Bay Municipality's population is predominantly Coloured (55.80%) followed by Black African (24.5%) and Whites (18%). In 2006 Black Africans made up 16% of the population. There has therefore been an in-migration of Black African's to the area in search of employment. The majority of the population, over 90%, is urbanised. This is the highest proportion of all the municipalities in the district.

In terms of age, 25.3% of the Saldanha Bay Municipality's population is below the age of 15, 69.5% fall within the economically active age group of 15-64, and the

remaining 5.2% are older than 65. The dependency ratio[22] decreased from 48.8 in 2001 to 44 in 2011, which is lower than the provincial average of 45 in 2011. This represents a socio-economic improvement.

Based on information from the West Coast Socio-Economic Profile (2006), Agriculture, Forestry and Fishing was the biggest employer in Saldanha in 2001, contributing 23.6% to employment while its contribution to the GDPR was only 11.9%. The Manufacturing Sector contributed 17.8% to total local employment, followed by CSP services (14.4%) and the Wholesale and Retail Trade; Catering and Accommodation (13.3%). The major employers in the fishing industry include companies such as Sea Harvest, which employs approximately 2 400 employees, Oceana, Southern Seas and West Point Processors (565 employees). In terms of the metals and mineral-processing companies (Manufacturing Sector), Saldanha Steel (Mittal SA) accounts for 790 permanent jobs, Namakwa Sands 950 and Duferco 325.

3.3.2 Saldanha Bay economy

The SBLM contributed R5.86 billion (30.56 %) of the WCDM total R19.16 billion GDPR in 2015. GDP growth averaged 2.95 % per annum over the period 2005–2015, which was below the District average of 3.42 %. In terms of employment, the SBLM employed 28 % of the West Coast District's labour force in in 2015. The SBLM notes that while Saldanha Bay experienced job losses prior to and during the recession, these jobs have been recovered and approximately 5720 (net) additional jobs have been created since 2005, with the majority been created post-2010.

The majority of the workforce in Saldanha Bay falls within the semi-skilled (32.50%) and low-skilled sector (32.14%). The semi-skilled sector experienced a contraction in employment over the long term (-0.1 % per annum over the period 2005 –2015), while low-skilled employment remained fairly stagnant over the long term and skilled employment, which makes up 13.35 % of the municipality's workforce, grew at a moderate rate of 1.9 % per annum since 2005. The informal sector, which employs 22 % of the municipality's workforce, experienced robust growth of 7.8 % per annum over the past decade.

The key sectors in the local economy consist of the primary and secondary sector.

Primary sector

Agriculture, forestry and fishing make up the primary sector of the SBLM economy, and contributed R887.21 million (15.15 %) to the Municipality's GDP in 2015. The sector has displayed steady growth of 2.85 % for the period 2005 – 2015, with a significant improvement of 4.49 % per annum over the period 2010 – 2015). The sector also employed 31.77% of the area's workforce. The labour force in the primary sector is characterised by a relatively large proportion of unskilled labour (43.32%). The semi-skilled sector employs 32.59 % of the industry's workforce and has grown at a rate of 4.4 % per annum since 2010. The skilled sector employs the smallest proportion of the municipality's workforce (5.20 %). This segment has

[22] 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 but it should be noted that it is not linked to the labour force or income earners (including those of pensionable age who have access to social or private pensions or other income).

shown robust growth post-recession (4.7 %). Despite the economic recovery since 2010 employment in agriculture, forestry and fishing sectors has stagnated over the long term (2005 – 2015). As a result the jobs lost for the period 2005–2010 have not yet been recovered.

Secondary sector

The key sectors in the secondary sector are the manufacturing, construction, commercial services, and government and community, social and personal services sectors. These are briefly discussed below.

Manufacturing

The manufacturing contributed R1.305 billion (22.3%) towards the Municipality's GDP in 2015, making it the second largest sector in the Saldanha Bay region. The sector has experienced moderate growth of 1.25 % per annum on average over the period 2010 – 2015, and fared slightly better over the long term with growth averaging 1.49 % per annum since 2005. The manufacturing sector employed 10.65 % of the area's workforce (making it the 4th largest employer in Saldanha Bay). The majority of workers employed in the manufacturing sector are classified as semi-skilled (39.6%) and low-skilled (31.8 %). Only 11.8 % of those employed in the manufacturing sector are categorised as skilled workers. The informal sector makes up 16.8 % of the industry's workforce and experienced robust long term growth as employment grew by 7.2 % per annum over the period 2005 – 2015.

Construction

The construction sector contributed R 239.3 million (4.08%) of the municipality's GDP in 2015. Despite the relatively small size of the sector, construction has been the fastest growing industry since 2005, with growth averaging 5.94 % per annum. The sector employed only 4.96 % of the area's workforce in 2015. Employment in the municipality's construction sector has however grown by 2.4 % per annum since 2005. The majority (42.4%) of the workers employed in the construction industry operate within the informal sector. Low-skilled employment makes up 17.5 % and semi-skilled employment makes up 33.1 % of the workforce in the construction industry. Employment within both these sectors has contracted over the past decade (with employment contracting the fastest in the latter half of the decade). This is linked to the global financial crisis of 2008. Skilled employment makes up only 7.1 % of the construction industry's workforce.

Commercial services

Commercial services sector encompass wholesale and retail trade, catering and accommodation, transport, storage and communication and finance, insurance, real estate and business services industries. This sector is the largest sector in the SBLM economy, contributing R2.404 billion (41.0 %) towards the GDP in 2015. The industry also grew at a faster rate than the overall municipality over the period 2005 – 2015, namely 3.59 % compared to the municipal average of 2.95%. The sector is also the largest employer in the local economy (32.1%). In addition, employment has shown consistent growth throughout the past decade recording a 3.4% growth rate per annum on average. It is also worth noting that 35.2% of the industry's workforce falls within the semi-skilled category, 18.6 % are low-skilled and 15.5% are skilled. The SBLM IDP notes that informal employment within the Commercial services industry makes up 30.6% of the industries workforce and has experienced robust growth of 10.8 per cent per annum since 2005. The informal sector is responsible for the majority of the new jobs created in the industry.

The commercial services sector includes tourism. The Saldanha Bay region's key tourist assets include the Saldanha Bay Harbour and the region's pristine coastline. Coastal settlements such as Langebaan, Saldanha, Jacobsbaai, Paternoster and St Helena Bay are the key anchoring destinations in the region. Major tourist attractions include the region's renowned flower displays (late August to mid-October), as well as whale, dolphin and bird watching opportunities. The coastline is also extensively used for recreational uses such as angling, cray-fishing and various water sports. The role of the tourism sector has been enhanced by the region's proximity to Cape Town and other large towns in the Boland region (Stellenbosch, Paarl and Wellington). In this regard the BLM SDF (2011) and Draft SDF (2017), both highlight the importance of the tourism sector.

The Paternoster tourism sector pitches itself at the high-end of the market, promoting the village as the "Franschhoek of the West Coast". The settlement's sense of place as picturesque and quaint traditional West Coast fishing village offering a relaxed holiday in a natural setting constitutes the main attraction. Tourist flows to Paternoster are year-round, and include many day-trippers and weekend visitors. The Paternoster Village Tourism Association currently has 54 members and facilities include a range of accommodation facilities (estimated total of 800 beds) and 8 restaurants. In addition to formalised accommodation facilities, a significant proportion of local residents supplement their income by renting out their properties to visitors. This source of income enables many residents to live in the settlement on a permanent basis.

At present no designated scenic drives or formalised tourism routes exist in the study area. Tourist flows appear to enter and leave the Vredenburg Peninsula either via the MR 240 (for Paternoster), or via the MR 533 (for the St Helena Bay/ Stompneusbaai area). No circular route has been established, and cross-traffic between the MR 240 and MR 533 appears to be limited at present. However, the 2011 SBLM SDF does recommend the establishment of a scenic drive network for the area.

Government and community and social and personal services

The general government and community, social and personal services contributed R943.63 million (16.1%) of the municipality's GDPR in 2015, making it the third largest contributor to the SBLM's GDP. The sector experienced GDPR growth of 3.61 % over the period 2005 – 2015. Despite only being the third largest sector, it employs 20.27% of the area's workforce, making it the second largest employer. Employment growth over the period 2005 – 2015 averaged 3.4 % per annum. However, employment growth slowed to 2.8% per annum over the post-recession period of 2010 – 2015. The majority of the workers fall within the low-skilled category (39.9%), whilst 23.9% are semi-skilled and 24.9 % are classified as skilled.

3.3.3 Future economic development

The SBLM LED Mid Term Strategy (2013) notes that Saldanha Bay has long term potential and is well positioned for exponential growth and development. This growth is linked to Oil and Gas, Manufacturing, Aquaculture and Tourism. The Strategy indicates that these sectors can impact on the Saldanha Bay economy to grow at a rate that can create or sustain jobs and quality of life of all residents, with immediate outcomes and outputs as indicated in the strategy map.

The establishment of the Saldanha Bay IDZ (SBIDZ) located within the Saldanha Bay Municipality represents a key component of the development of the local and regional economy. An IDZ is a purpose built, industrial estate linked to an international air or sea port, which might contain one or multiple Customs Controlled Areas tailored for manufacturing and storage of goods to boost beneficiation, investment, economic growth and, most importantly, the development of skills and employment in these regions. IDZs are intended to promote the competitiveness of the manufacturing sector and to encourage beneficiation of locally available resources. The key objectives of the IDZ programme include the following:

- Attract foreign direct investment;
- Attract advanced foreign production and technology methods in order to gain experience in global manufacturing and production networks;
- Develop linkages between domestic and zone-based industries; and
- Provide world-class industrial infrastructure.

The IDZ extends from the Port area in the south up to Regional Route 45 (R45) to the north, and includes land both east and west of the Sishen-Saldanha rail line which runs through the central part of the area in a north-south direction. It is the area around the present industrial area, i.e. around ArcelorMittal South Africa (Saldanha Works), Duferco Steel Processing (Pty) Ltd (Duferco), Tronox (Sands Smelter) and other industries.

3.3.4 Growth and Development Potential

A study (Centre for Geographical Research, 2004) of the growth potential of the towns in the Western Cape was commissioned by the Department of Environmental Affairs and Development Planning (Western Cape) to provide the Department with a better understanding of the developmental potential and challenges of the Western Cape. The Study was undertaken within the context of the strategic requirements as pointed out in the National Spatial Development Perspective. The findings of the Study played a crucial role in informing the drafting of the PSDF.

The Study investigated 131 towns in the province with regard to assessing their development potential for infrastructural investment, as well as assessing their human need with a view to social investment in their people. The study also investigated and diagnosed rural-urban development issues faced by the province, and made recommendations towards improving the *status quo*.

Two investment types, 'Town/Infrastructural investment' and 'Social/People investment', were used as points of departure in order to identify the appropriate investment type best suited to stimulate economic growth and social investment for each of the relevant urban communities/ towns:

- High Need/Low Development: *Social investment required*;
- Low Need/High Development: *Town investment required*;
- High Need/High Development: *Social and Town investment required*;
- Low Need/Low Development: *Minimal investment required*.

The assigning of development potentials to specific towns included quantitative (survey of existing infrastructure, retail and services providers, etc) and qualitative

aspects (based on the self-perception of its inhabitants). The following five qualitative categories were defined:

- ***"Very Low"*** and ***"****Low" growth potential*:
  Towns with a proven track record of growth, but wishing to retain their present character and therefore rejecting major development; *or* towns with limited economic and human resources, devoid of the potential to stimulate the urban economy.
- *"Medium" growth potential*:
  Consistent and moderate growth prevails in these towns and certain sectors of the economy show signs of growth, or have the potential for it;
- *"High"* and *"Very High" growth potential*:
  Towns displaying sustainable growth combined with an established and proven track record to operate as 'regional leaders'. Potential to grow at a sustainable and powerful rate in line with the capacity of their resources and to operate as service providers to a relatively extensive hinterland. The difference between 'High' and 'Very High' status only lies in the diversity and intensity of the town dynamics (Centre for Geoscience Research, 2004,)

The Study appears to have subsumed the Britannica Bay/ Golden Mile and Stompneusbaai areas under St Helena Bay. Based on the Study, St Helena Bay was identified as a town with *a low-low development potential* and *low need*. In the study it is identified as a town that qualifies for infrastructural investment.

Part of the study also investigated "the dominant *economic base* and *place identity"* of each town to better understand and appreciate the various settlements' development potential. In this regard, St Helena Bay's economic base was identified as ""Fishing/ Residential". The town's "place identity" was identified as "Fish pantry of the Western Cape".

The neighboring towns of Saldanha and Vredenburg were identified as towns with high and very high development potential. Saldanha's potential was linked to its strong Transportation/Communication role as an important harbour and railway node. Vredenburg's rating is linked to its strong position regarding Institutional and Commercial Services, as well as its Market Potential and Regional Vitality. The report notes that Vredenburg demonstrates a well-balanced and diversified development structure, with only Natural Resources not being well endowed.

Based on the above, it is clear that the coastal area in the vicinity of the site is an important fishing area. The importance of the fishing sector has however decreased in recent years and this has been accompanied by an increase in the importance of the tourism sector, including the establishment of holiday homes. The areas proximity to Cape Town and the two largest towns in the area, Saldanha and Vredenburg, add to the areas attraction as a tourist and holiday destination.

3.4 DEMOGRAPHIC OVERVIEW OF STUDY AREA

As indicated in Table 3.1., the population of the West Coast District Municipality (WCDM) increased by from 282 672 in 2001 to 391 766 in 2011, which represents a significant increase of ~ 38.5%. The population of the Saldanha Bay Local Municipality (SBLM) increased from 70 261 in 2001 to 99 193 in 2011, an increase of

42.0 % over the same period. This represents an average annual increase of ~ 3.26 % and 3.45 % for the WCDM and SBLM respectively. The increase in the population in both the WCDM and SBLM was largely linked to an increase in the economically active 15-65 year age group. The increase in the economically active 15-65 age group in also reflected in the decrease in the dependency ratios in both the WCDM and SBLM (see below). It also reflects an influx of job-seekers to the area. As expected, the number of households in both the WCDM and SBLM increased between 2001 and 2011. The size of the households in both areas decreased marginally, from 3.5 to 3.4 in the WCDM and 3.7 to 3.2 in the SBLM.

The 2016 Community Survey indicates that the population of the SBLM increased to 111 173 in 2016 from 99 193 in 2011. The forecasts of the Western Cape Department of Social Development, is that this total will gradually increase across the 5-year planning cycle and is expected to reach 122 265 by 2023. This equates to an approximate 9.8 % growth off the 2017 base estimate (SBLM IDP, 2017-2022).

The majority of the population is in the SBLM was Coloured (55.89%), followed by Black Africans (24.5%) and Whites (18.0%)(Census, 2011). The dominant language within the Municipality is Afrikaans (~70.8%), followed by isiXhosa (~16.0%) and English (~6.5%)(Census 2011).

Table 3.1: Overview of key demographic indicators for the WCDM and SBLM

	WCDM		SBLM	
ASPECT	**2001**	**2011**	**2001**	**2011**
Population	282 672	391 766	70 261	99 193
% Population <15 years	28.7	25.5	28.9	25.3
% Population 15-64	66.1	68.5	67.2	69.5
% Population 65+	5.2	6.0	3.9	5.2
Households	73 449	106 781	18 663	28 835
Household size (average)	3.5	3.4	3.7	3.2
Formal Dwellings %	90.5 %	87.9 %	84.6 %	81.7 %
Dependency ratio per 100 (15-64)	51.4	45.9	48.8	44.0
Unemployment rate (official) - % of economically active population	13.8 %	14.6 %	21.5 %	23.4 %
Youth unemployment rate (official) - % of economically active population 15-34	18.1 %	19.9 %	26.8 %	30.4 %
No schooling - % of population 20+	9.5 %	5.4 %	5.1 %	2.4 %
Higher Education - % of population 20+	7.0 %	8.1 %	7.7 %	9.3 %
Matric - % of population 20+	19.1 %	23.7 %	22.2 %	28.4 %

Source: Compiled from StatsSA Census 2011 Municipal Fact Sheet

The dependency ratio in both the WCDM and SBLM decreased from 51.4 to 45.9 and 48.8 to 44.0 respectively. The age dependency ratio is the ratio of dependents, people younger than 15 or older than 64, to the working age population, those ages being 15-64. The increase represents a positive socio-economic improvement, and reflects a decreasing number of people dependent on the economically active 15-64 age group. This decrease is linked to the increase in the percentage of economically

active people in both the WCDM and SBLM. The dependency ratio in the SBLM is lower than the provincial ratio of 45.0, while the ratios of the WCDM and the SBLM are both lower than the national figure of 52.7.

The Western Cape Department of Social Development reflected in the 2016 Socio-Economic Profile indicates that there is an increasing dependency ratio of 44.0, 46.3 and 46.9 for the respective years of 2011, 2017 and 2023. As higher dependency ratios imply greater strain on the working age to support their economic dependents (children and aged), this increase will have far reaching social, economic and labour market implications.

In terms of percentage of formal dwellings, the number of formal dwellings in the WCDM decreased from 90.5% in 2001 to 87.9 3% in 2011. In the SBLM the number of formal dwellings also decreased from 84.6% to 81.7% for the same period. This is likely to reflect the influx of job seekers to the area from areas such as the Eastern Cape Province.

Employment

The official unemployment rate in both the WCDM and SBLM also increased for the ten year period between 2001 and 2011. In the WCDM the rate increased from 13.8% to 14.6%. In the SBLM the rate increased from 21.5% to 23.4%. Youth unemployment in both the WCDM and SBLM also increased over the same period. However, the unemployment and youth unemployment rates in the WCDM are lower than the provincial figures of 21.6% and 29.0% respectively. The figures for the SBLM are however higher. This is likely to be due to influx of job seekers to the SBLM and their inability to find employment. In addition, job losses are likely to be associated with the decline in the role of the fishing sector and the subsequent loss of employment opportunities in this sector.

Household income

Based on the data from the 2011 Census, 14 % of the households in the SBLM have no formal income, 2% earn up to R 4 800, 4% earn between R 4 801 and R 9 600 per annum, 11% between R 9 601 and R 19 600 per annum and 17% between R 19 600 and R 38 200 per annum (Census 2011). The poverty income datum for households is linked to the number of household members (Western Cape Provincial Treasury, 2012a - "Definitions"). According to this yardstick, the average poor South African household (5.1 people) requires R1 6371/ month just to subsist, and R3 162/ month to meet the most basic of food and other needs. The City of Cape Town uses a figure of R3500.00 per month. Based on this measure 48% of the households in the SBLMs in 2011 live close to or below the poverty line. The low income levels are a major concern given that an increasing number of individuals and households are likely to be dependent on social grants. The low income levels also result in reduced spending in the local economy and less tax and rates revenue for the district and local municipality.

Based in the 2016 Community Survey data, 14.1 % of the population of the SBLM have no formal income, 2.3% earn up to R 4 800, 3.9% earn between R 4 801 and R 9 600 per annum, 10.9% between R 9 601 and R 19 600 per annum and 17.4% between R 19 600 and R 38 200 per annum. The total percentage of households that live close to or below the poverty line increase marginally from 48% in 20111 to 48.6% in 2016. The number of indigent households also increased between 2014

and 2015, which implies an increased burden on municipal resources (SBLM IDP, 2017-2022).

Education
The education levels in both the WCDM and SBLM improved between 2001 and 2011, with the percentage of the population over 20 years of age with no schooling in the WCDM decreasing from 9.5 1% to 5.4%. For the SBLM the decrease was from 5.1% to 2.4%. The percentage of the population over the age of 20 with matric also increased in both the WCDM and SBLM, from 19.1% to 23.7% in the WCDM and 22.2% to 28.4% in the SBLM. The matric pass level in the WCDM is however lower than the provincial average of 28.1%.

3.5 MUNICIPAL SERVICE LEVELS

As indicated in Table 3.2, the provision of and access to municipal services as measured in terms of flush toilets, weekly refuse removal, piped water and electricity, increased in both the WCDM and SBLM for the period 2001 to 2011. As indicated in Table 3.2 there have been significant improvements in the number of households with access to piped water inside their dwellings in both the WCDM and SBLM. These improvements also contribute significantly to the overall improvement in the quality of life of the residents of the WCDM and SBLM.

Table 3.2: Overview of access to basic services in the WCDM and SBLM

	WCDM		SBLM	
	2001	**2011**	**2001**	**2011**
% households with access to flush toilet	80.8	85.6	90.5	92.5
% households with weekly municipal refuse removal	69.4	76.5	96.2	96.6
% households with piped water inside dwelling	69.1	78.7	67.2	80.2
% households which uses electricity for lighting	88.1	94.4	91.5	97.8

Source: Compiled from StatsSA Census 2011 Municipal Fact Sheet

3.6 OVERVIEW OF SITE AND SURROUNDING LAND USES

The proposed Boulders WF site is located ~6 km to the north of the town of Vredenburg, 1.1 km west of the coastal settlement of Paternoster, and 2.5 km south of St Helena Bay. The existing West Coast One (WC01) 45 turbine WF is located adjacent to the south and east of the proposed WF. Primary access to the study area is from Vredenburg via the Paternoster tarred road and the Stompneusbaai gravel road.

The Paternoster Road (R399) is tarred and links Vredenburg to the coastal town of Paternoster. The road provides primary access to Paternoster as well as the Cape Columbine Nature Reserve (CCNR) located to the west of the town. Wind turbines associated with the existing WC01 WF are visible along various stretches of the road (Photograph 3.1). The civil aviation lights are also visible at night.

Photograph 3.1: Wind turbines associated with WC01 WF located to the north of Paternoster Road (R399)

The Stompneusbaai gravel road intersects the Paternoster Road north west of Vredenburg. From this point the road runs northwards, where it intersects with the St Helena Bay coast road outside Stompneusbaai. The road runs to the east (inland) of Kasteelberg and provides the most direct link between Vredenburg, Stompneusbaai and the St Helena Bay coast road. The road passes through undulating farming landscape, made up of wheat fields and grazing land on both sides.

The topography of the area consists of low undulating hills, interspersed by granite outcrops. Kasteelberg is the most significant topographical feature and its nearest point is located 1.9 km west of the Stompneusbaai Road (Photograph 3.2). Kasteelberg is considered one of the richest pre-colonial archaeological Khoi-Khoi sites in South Africa and is currently proposed as a Provincial Heritage Site (PHS). Kasteelberg also forms a key component of the area's sense of place. The site is located on private land not accessible to the public.

Photograph 3.2: Stompneusbaai Road looking south with Kasteelberg on the right

Existing turbines associated with WC01 WF are visible along various stretches of the Stompneusbaai gravel road (Photograph 3.3). The flashing, red civil aviation lights located at the top of the wind turbine hubs are also clearly visible at night. The wind turbines associated with the WC01 are all located to the east of the Stompneusbaai gravel road, the nearest being 550 m from the road.

Photograph 3.3: Wind turbines associated with WC01 WF viewed from Stompneusbaai Road.

The St Helena Bay Road is a tarred road which links the R399 (Velddrif-Vredenburg) road to the coastal settlements which comprise the suburbs of St Helena Bay and the Shelly Point development. As indicated above, the range of hills inland from the road shields the coastal settlements and the road from the existing WC01 and proposed Boulders WF. The Britannica Heights residential area is located on the northern slopes of these hills and along the top of the ridge. The Skuitjiesklip gravel road provides a link between the Paternoster and Stompneusbaai Roads. Skuitjiesklip and Uitkoms Farms are accessed off the road. The road, together with a portion of the Stompneusbaai Road, provides a link between Paternoster and St Helena Bay, therefore forming part of a circular route. The Koppiesveld Road is aligned between the Stompneusbaai Road and the R399 (Velddrif Road). The road provides access to the WC01 WF site as well as a number of farms located in the area between the coastal range of hills and the Stompneusbaai Road. These include Soldatepos, Skuitjies and Fransvlei. The southern portion of the road was used during the construction of the WC01 WF.

St Helena Bay

St Helena Bay comprises the stretch of coastal settlements extending along the coast from Laingville in the south to Duyker Eiland in the north. This stretch includes the settlements of St Helena Bay, Sandy Point, Britannica Heights, Stompneusbaai, Shelley Point, Golden Mile, Britannica Bay and Cape St Martin. With the exception of the houses located along the top of Britannica Heights, all of the areas are screened from the existing WC01 and proposed Boulders WF by the natural topography (Photograph 3.4). All of the suburbs are primarily accessed off the St Helena Bay coastal road.

Photograph 3.4: Sandy Point and St Helena Bay viewed from Vasco da Gama Drive in Britannica Heights.

Britannica Heights

Britannica Heights consists of 126 residential erven located on the north facing slopes and crest of the range of coastal hills to the west of the St Helena Bay coastline. The development was approved in 1993, shortly before independence in 1994, and sold out in the same year. The first houses were established ~ 20 years ago. There are currently around 40 developed erven, with many developed since 2012 (Photograph 3.5). The majority of owners reside permanently on their properties. A few also accommodate guest accommodation facilities, such as the Country Cabin on Columbine Crescent.

Britannica Heights is regarded as one of the prime suburbs of St Helena Bay. Although it is not located on the coast it is has excellent views. The properties located on the northern slopes over look St Helena Bay, while the properties located on Vasco da Gama Drive and Columbine Street, which are located along the crest of the ridge, provide views looking north over St Helena Bay and south towards Cape Columbine, Kasteelberg and Paternoster. It is worth noting that the development pre-dates the 2002 Guideline on Development on Mountains and Ridges which subsequently put a stop to such developments.

Photograph 3.5: House in Britannica Heights at the intersection of Vasco da Gama Dr and Columbine Crescent with existing WC01 WF wind turbines in the background

The wind turbines associated with the WC01 WF are visible from Vasco da Gama Drive and Columbine Crescent (Photograph 3.6). Property owners along these roads indicated that the flashing red civil aviation lights associated with the WC01 WF have had the most significant impact on the areas sense of place.

Photograph 3.6: View south from residence at 7 Vasco da Gama Drive with existing turbines and proposed development area in middle distance and Kasteelberg in far distance

Paternoster

Paternoster is small settlement (population of 1 971 in 2011) located along the west coast approximately 15 km north of Vredenburg. The settlement originated around fishing and cray-fishing and associated processing activities. The collapse of local fish and crayfish stocks over the past 10-20 years has however seen the closure of local processing plants and significant reduction in the role played by the local fishing sector. Today Paternoster and its economy are closely linked to tourism and lifestyle residential land uses. Unlike the majority of South African settlements there is a high degree of spatial integration between low and high income groups.

Much the town's transformation dates to after 2000. New suburbs and properties were developed for lifestyle residential and tourism uses. The town's coastal setting, the existing "sleepy West Coast fisherman's village" with its modest fisherman's cottages, unspoilt beaches and the scenic landscape associated with the surrounding Vredenburg Peninsula and Koppiesveld form the key attractions for visitors and property owners to Paternoster and the surrounds (Photograph 3.7). The town's sense of place can be described as that of a relatively undisturbed West Coast fishing village located adjacent to and within a west coast wheat farming area. The area also attracts visitors to the annual spring flower displays.

Photograph 3.7: Paternoster coastal village

In addition, Paternoster is located within a two hour drive of Cape Town and the Boland. This makes it a convenient destination for locals, overseas tourists and second home owners. It also makes it an ideal destination for day-trippers. According to the Saldanha Bay Tourism Office, the Saldanha Bay Municipal Area is currently responsible for 41% of the measured tourism activity in the West Coast District Municipality. The two key tourist attractions are the Langebaan Lagoon and Paternoster. Key attractions associated with Paternoster include the picturesque village itself, spring flower displays (dependent on rainfall), the Cape Columbine Nature Reserve and Tietiesbaai, seasonal sightings of whales and dolphins, and the coastline (van der Merwe, pers. comm). Many visitors also take a circular route along the peninsula, namely from Vredenburg to Paternoster via the Paternoster Road, then to Stompneusbaai via the Skuitjiesklip Road and the northern portion of the Stompneusbaai Road, and then along the coast to the Velddrif Road via the St Helena Bay Road (or the other way around). This route is popular with spring flower visitor flows and with day trippers. As indicated above, the existing WCO1 WF is visible from sections of the Paternoster Road and Skuitjiesklip Road.

All development in Paternoster is subject to approval by the local aesthetic committee. As a result, the settlement has largely managed to retain its character as a traditional west coast fishing village (Photograph 3.8). The nearest existing turbines associated with the WC01 WF are located ~ 7.6 km inland from Paternoster (Pilgrimsrust smallholdings). While most of the town fronts towards the sea (and therefore away from the existing turbines and proposed Boulders WF), the aviation lights associated with existing turbines are visible at night from Pilgrimsrust, the entrance to Paternoster as well as along the coast. Photograph 3.9 illustrates the turbines from the intersection between the R399 and the gravel road that links

Paternoster with the Stompneus Bay Road, with Kasteelberg located on the left of the photograph.

Photograph 3.8: View of houses in Paternoster looking north

Photograph 3.9: View looking inland from Paternoster with Kasteelberg flanked by wind turbines associated with WC01 to the south

The visual quality of the area to the south of the Kasteelberg has been impacted by the turbines associated with the WC01 WF (Photograph 3.10).

Photograph 3.10: View looking inland from the beach at Paternoster with Kasteelberg flanked by wind turbines associated with WC01 to the south

Adjacent rural area

Properties in the rural area around the proposed WF site are traditionally used for mixed farming activities. The majority of the inland properties in the Koppiesveld are used primarily for farming purposes, while coastal properties tend to be associated with tourism, conservation and residential development (e.g. Groot Paternoster Private Nature Reserve). The farms in the Koppiesveld are located in closer proximity to the Boulders WF than the coastal ones. Many of them are directly or indirectly accessed off the Stompneusbaai gravel road which traverses the WF site. Few, if any of the farming properties appear to offer tourism accommodation or other facilities at present.

SECTION 4: IDENTIFICATION OF KEY SOCIAL ISSUES

4.1 INTRODUCTION

Section 4 identifies and provides an initial assessment of the key social issues likely to be associated with the proposed development. As indicated below, the assessment is based on the findings of the SIA undertaken for the previous WF proposed for the site and the author's experience with renewable energy projects, including wind energy projects. A detailed assessment of the issues will be undertaken during the assessment phase of the EIA.

4.2 ASSUMPTIONS AND LIMITATIONS

4.2.1 Assumptions

The identification and initial assessment is based on the findings of the SIA undertaken for the previous WF proposed for the site and the author's experience with renewable energy projects, including wind energy projects. In this regard it is assumed that the key social issues are likely to be similar. However, it should be noted that the comments on the social impacts contained in the Social Scoping Report are preliminary and will be confirmed during the Assessment Phase.

Detailed enhancement and mitigation measures will also be identified during the Assessment Phase.

4.2.2 Limitations

No site visit was undertaken in preparing the Social Scoping Report. In this regard it is only possible to effectively interact with key stakeholders once they are fully aware of the new project, which is typically once the Scoping Report has been circulated for comment. However, as indicated above, the author's undertook the SIA for the previous WF proposed on the site and are therefore familiar with the study area and the social issues associated with the establishment of a WF in the area. A site visit and follow-up interviews with key stakeholders will be undertaken as part of the assessment phase. The assessment of key social issues will also be informed by other key specialist studies, including the Visual Impact Assessment (VIA) and Heritage Impact Assessment (HIA).

4.3 IDENTIFICATION OF KEY SOCIAL ISSUES

The key social issues are associated with:

- Compatibility with relevant policy and planning context ("planning fit");
- Social issues associated with the construction phase;
- Social issues associated with the operation phase;

- Social issues associated with "no development" alternative;
- Social issues associated with cumulative impacts.

4.2 ASSESSMENT OF POLICY AND PLANNING FIT

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

The findings of the review indicate that renewable energy is strongly supported at a national, provincial and local level. The development of and investment in renewable energy is supported by the National Development Plan (NDP), New Growth Path Framework and National Infrastructure Plan, which all make reference to renewable energy. At a provincial level the development of renewable energy is supported by the Western Cape Provincial Strategic Plan, Western Cape Provincial Spatial Development Framework (SDF), West Coast District Municipality Integrated Development Plan (IDP) and SDF and the Saldanha Bay Municipality IDP and SDF.

The section below provides a summary of relevant provincial and local policies and planning documents that support renewable energy.

White Paper on Sustainable Energy for the Western Cape
The vision underpinning the White Paper is "t*he Western Cape has a secure supply of quality, reliable, clean and safe energy, which delivers social, economic and environmental benefits to the Province's citizens, while also addressing the climate change challenges facing the region and the eradication of energy poverty* (White Paper, p15).

Western Cape Climate Change Response Strategy
The Strategy document notes that renewable energy is a key area of focus for the Western Cape, and forms a fundamental component of the drive towards the Western Cape becoming the green economy hub for Africa. The role of provincial government is identified as 'supporting the development of the renewable energy industry through promoting the placement of renewable energy facilities in strategic areas of the Western Cape as well as through supporting renewable energy industries'.

Provincial Strategic Plan 2014-2019
The Plan notes that PGWC has prioritised the development of a green economy, with the further aim of establishing it as the green economic hub of Africa. In terms of key goals, under Strategic Goal 1, energy security is identified as a game changer, and notes that future energy security priorities include scaling up renewable energy generation in the province.

Western Cape Provincial Spatial Development Framework
The SDF lists a number of policies that support renewable energy, including, Policy R.4.6: *Pursue energy diversification and energy efficiency in order for the Western Cape to transition to a low carbon, sustainable energy future, and delink economic growth from energy use,* and Policy R.4.7: *Support emergent Independent Power Producers (IPPs) and sustainable energy producers (wind, solar, biomass and waste*

conversion initiatives) in suitable rural locations (as per recommendations of the Strategic Environmental Assessments for wind energy (DEA&DP) and renewable energy (DEA)[23] (p.52)).

The SDF also notes that cultural and scenic landscapes in provinces are significant assets that underpin the tourism economy. The SDF also notes that a number of scenic landscapes of high significance are under threat from a number of developments, including large scale infrastructural developments such as ***wind farms.*** With regard to the development of renewable energy projects the SDF lists a number of policy provisions that are relevant to the proposed Boulders WF, namely, R.5.6: *Priority focus areas proposed for conservation or protection include landscapes under pressure for large scale infrastructural developments such as* ***wind farms****, solar energy facilities, transmission lines and fracking, e.g. Central Karoo*.

Western Cape Green Economy Strategy Framework
The core objective of the Strategy is to position the WCP as a leading green economy hub on the African continent. The document also notes that the WCP is well placed to be the most important research and servicing hub for the renewable energy sector in South Africa and the African continent. The Strategy also notes that there are important initial opportunities in the construction of new energy infrastructure. However, the real long-term benefits lie in the servicing of operational infrastructure. In this regard, it is estimated that the annual servicing and maintenance costs of WFs for instance amount to approximately 10% of the initial capital investment.

Western Cape Draft Strategic Plan
The plan identifies the importance to the wind sector in mainstreaming sustainability and optimising resource use and efficiency.

West Coast District Municipality Integrated Development Plan
The promotion of the West Coast as a renewable energy investment destination is identified as an opportunity in the West Coast DM. Under Strategic Objective 2: Pursuing economic growth and the facilitation of job opportunities, the IDP also highlights the importance to developing private public partnerships to support and facilitate economic development in the WCDM. Strategic Objective 3: Promoting social wellbeing of the community, identifies the key economic and social challenges and opportunities facing the area, including unemployment and dependency on government grants, and limited employment opportunities for the youth. Tourism is also listed as a key development sector for regional and local economic development.

West Coast District Municipality Spatial Development Framework
The proposed development of renewable energy facilities is aligned with and supports a number of the strategic objectives listed in the WCSDF. These include the creation of opportunities for growth and jobs and reduce poverty, and mainstreaming sustainability and optimising resource-use efficiency. In this regard the SDF notes that renewable energy (wind, solar, etc.) should be established to support and enhance the electricity capacity in the West Coast District (BE16). The SDF also highlights the potential risks posed by climate change. Of specific relevance to the proposed development are the eight mitigation focus areas, including Renewable Energy, which is identified to address the challenges associated with climate change.

[23] See notes under Regional Methodology Review below.

The establishment of renewable energy in the WCDM in suitable locations is therefore supported.

While the SDF supports the development of renewable energy, it also notes that wind farms should be located where they will cause least visual impact taking into consideration the viability of the project (HR 27) and located where their visual and environmental impact will be the lowest (BE 17). The development of renewable energy projects must also take into account potential impact on tourism, specifically impact on tourist corridors and routes (HR4). The SDF also notes that the area's tourism attractions are linked to natural features, scenic qualities and coastal villages. The small coastal towns, including Paternoster are identified as key tourism destinations.

Saldanha Bay Municipality Municipal SDF[24]

The SDF document identifies the region's potential for accommodating renewable energy projects. In terms of siting principles, the document refers to the principles contained in the 2006 DEA&DP Regional Methodology document (see: Section 4.3.3. above). The key principles include, excluding commercial WF developments from areas with high aesthetic landscape value and encouraging development of WFs in in areas where visual disturbance to the landscape has already occurred (e.g. power transmission lines). The SDF does not provide any spatial guidance with regard to the appropriate siting of WFs in the SBLM area itself. Of relevance to the proposed development is the siting principles contained in the 2006 DEA&DP Regional Methodology document (see: Section 4.3.3. above), note that focus should be on the development of large concentrated wind farms rather than small dispersed locations.

Saldanha Bay Municipality Local Economic Development (LED) Strategy

The LED strategy explicitly discusses the development of renewable energy resources as a viable environmentally sustainable economic sector within the Saldanha Bay LM area.

Conclusion

In conclusion, based on the review of key planning documents that pertain to the study area, it is clear that the development of renewable energy (including wind farms) in the West Coast District and Saldanha Bay Local Municipality is strongly supported. However, the documents also highlight the need to ensure that the siting of renewable energy facilities (including wind farms) does not impact on the area's tourism potential and scenic assets.

4.3 CONSTRUCTION PHASE IMPACTS

As indicated above, the initial assessment is based on the findings of the SIA undertaken for the previous WF proposed for the site and the author's experience with renewable energy projects, including wind energy projects. The significance ratings will be confirmed during the assessment phase. Detailed enhancement and mitigation measures will also be identified during the Assessment Phase.

The key social issues associated with the construction phase include:

[24] A Draft SDF was published in September 2017. Until this Draft is finalised the existing 2011 SDF remains in place

Potential positive impacts

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

Potential negative impacts

- Impacts associated with the presence of construction workers on site and in the area;
- Influx of job seekers to the area;
- Increased safety risk to farmers, risk of stock theft and damage to farm infrastructure associated with presence of construction workers on the site;
- Increased risk of grass fires;
- Impact of heavy vehicles, including damage to roads, safety and dust;
- Impact on farming activities.

4.3.1 Creation of local employment, training, and business opportunities

Based on the information from other WF projects the construction phase for a 140 MW WF is expected to extend over a period of 20-24 months and create approximately 250 (full-time equivalent) employment opportunities during peak construction. The work associated with the construction phase will be undertaken by contractors and will include the establishment of the WF and the associated components, including, access roads, substation, services and power line. It is anticipated that approximately 55% (136) of the employment opportunities will be available to low skilled workers (construction labourers, security staff etc.), 30% (76) to semi-skilled workers (drivers, equipment operators etc.) and 15% (38) for skilled personnel (engineers, land surveyors, project managers etc.).

Members from the local community in the area are likely to be in a position to qualify for the majority of the low skilled and a proportion of the semi-skilled employment opportunities. The majority of these employment opportunities are also likely to accrue to Historically Disadvantaged (HD) members from the local WCDM and SBLM community. As indicated above, the levels of unemployment in the WCDM and SBLM are relatively high. The towns that are likely to benefit are Vredenburg, Saldanha Bay and Paternoster. The creation of potential employment opportunities, even temporary employment, will represent a significant, if localised, social benefit.

The potential benefits for local communities is confirmed by the findings of the Overview of the Independent Power Producers Procurement Programme (IPPPP) undertaken by the Department of Energy, National Treasury and DBSA (30 September 2016). The study found that employment opportunities created during the construction phase of the projects implemented to date had created 61% more jobs than anticipated. The study also found that significantly more people from local communities were employed during construction than was initially planned. In this regard the expectation for local community participation was 6 771 job years. To date 15 215 job years have been realised (i.e. 125% greater than initially planned). Black South African citizens, youths and rural or local communities have been the major beneficiaries during the construction phases, as they respectively represent 80%, 41% and 52% of total job opportunities created by IPPs to date.

The study also found that the share of black citizens employed during construction (80%) had significantly exceeding the 50% target. Likewise, the share of skilled

black citizens (as a percentage of skilled employees) for both construction and operations has also exceeding the 30% target and is at least 3.5 times more than the minimum threshold of 18%. The study also found that the share of local community members as a share of SA-based employees was 52% and 68% for construction and operations respectively – at least 4 times more than the minimum threshold of 12% and more than 2.5 times more than the target of 20%.

Given the proximity of the site to Saldahna Bay and Vredenburg there is likely to be a pool of suitably qualified local community members that could be employed during the construction phase. Where feasible the implementation of a training and skills development programme prior to the commencement of construction would also increase the potential to employ local community members. The number of low skilled and semi-skilled positions taken up by members from the local community will depend on the effective implementation of these enhancement measures by the proponent in consultation with the WCDM and SBLM. In this regard the local Councillor (Mr Scholtz) indicated that the local Paternoster and St Helena Bay communities did not benefit significantly from the employment opportunities associated with the construction of Moyeng WC01. Mr Scholtz indicated that these communities should be earmarked for preferential employment and skills training (Scholtz, pers. comm).

The capital expenditure associated with the construction of a 140 MW WF will be in the region of R 2.5 billion (2017 Rand value). A percentage of the capital expenditure associated with the construction phase has the potential to benefit local companies and communities.

The Green Jobs study (IDC, DBSA, and TIPS, 2011) found that South Africa is in a position to leverage upon some of its existing manufacturing capacities in order to produce components and parts for various sections of wind turbines, especially those industries involved in the production of steel and metal products, as well as the boat building and electrical industries. These types of industries are all located in the Saldanha Bay Municipality and the broader West Coast DM. A Market Intelligence Report on Renewable Energy (Greencape, 2014) indicates that a Green Development Hub is being established in Atlantis. In this regard Gestamp has established a wind turbine manufacturing operation in Atlantis. .

The proposed WF will therefore create opportunities for engineering and construction companies in Vredenburg and Saldahna Bay. Opportunities will also be created for companies based Cape Town and Atlantis. Implementing the enhancement measures listed below can enhance these opportunities.

The total wage bill for the 20-24 month construction phase of a 140 MW WF will be in the region of R 69 million (2016 Rand value). This is based on an average monthly wage of R 8 000 for low-skilled workers, R 12 000 for semi-skilled workers and R 30 000 for skilled workers over a period of 22 months. Given that the construction workers will be based in local towns in the area, such as Vredenburg and Saldanha, a percentage of the wage bill will be spent in the local economy over the 18-24 month construction phase. This will create opportunities for local businesses in local towns in the area, specifically Vredenburg and Saldanha. The sector of the local economy that is most likely to benefit from the proposed development is the local service industry. This is confirmed by the experience with the other renewable projects. The potential opportunities for the local service sector are linked to accommodation,

catering, cleaning, transport and security, etc. associated with the construction workers on the site.

The local tourism industry in the area, including restaurants and accommodation facilities, will also benefit. In this regard semi-skilled and skilled workers are likely to frequent local tourism destinations in the area over weekends. Families of workers may also take the opportunity to visit the area over weekends. The hospitality industry in the area will also benefit from the provision of accommodation and meals for professionals (engineers, quantity surveyors, project managers, product representatives etc.) and other (non-construction) personnel involved on the project. Experience from other renewable energy projects indicates that the potential opportunities are not limited to on-site construction workers but also to consultants and product representatives associated with the project. The benefits to the local economy will be confined to the construction period (20-24 months).

The implementation of the proposed enhancement measures would also enable the establishment of the proposed WF to support co-operation between the public and private sectors which would support local economic development in the WCDM and SBLM.

Table 4.1: Impact assessment of employment and business creation opportunities during the construction phase[25]

Nature: Creation of employment and business opportunities during the construction phase.		
	Without Mitigation	**With Enhancement**
Extent	Local – Regional (3)	Local – Regional (4)
Duration	Short term (2)	Short term (2)
Magnitude	Moderate (6)	High (8)
Probability	Highly probable (4)	Highly probable (4)
Significance	Medium (44)	Medium (56)
Status	Positive	Positive
Reversibility	N/A	N/A
Irreplaceable loss of resources?	N/A	N/A
Can impact be enhanced?	Yes	
Enhancement: See below		
Cumulative impacts: Opportunity to up-grade and improve skills levels in the area.		
Residual impacts: Improved pool of skills and experience in the local area.		

[25] An economic modelling technique will be utilised in order to quantify the impact on employment and business opportunities. This will be undertaken in the EIA phase as part of a separate economic assessment. The proposed terms of reference are contained in Annexure E.

4.3.2 Impact of construction workers on local communities

Experience has shown that the presence of construction workers can pose a poses a potential risk to family structures and social networks. These risks however tend to be more pronounced in isolated rural areas. While the presence of construction workers does not in itself constitute a social impact, the manner in which construction workers conduct themselves can impact on local communities. The most significant negative impact is associated with the disruption of existing family structures and social networks. The risks are linked to:

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

Employing members from the local community to fill the low-skilled job categories will reduce the risk and mitigate the potential impact on the local communities. The use of local residents to fill the low skilled job categories will also reduce the need to provide accommodation for construction workers in Vredenburg and Saldanha Bay.

While the risks associated with construction workers at a community level will be low, at an individual and family level they may be significant, especially in the case of contracting a sexually transmitted disease or an unplanned pregnancy. However, it will not be possible to avoid this. This potential risk should also be viewed within the context of the socio-economic benefits associated with the creation of employment opportunities for locals.

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

Nature: Potential impacts on family structures and social networks associated with the presence of construction workers		
	Without Mitigation	**With Mitigation**
Extent	Local (2)	Local (1)
Duration	Short term for community as a whole (2)	Short term for community as a whole (2)
Magnitude	Low for the community as a whole (4)	Low for community as a whole (4)
Probability	Probable (3)	Probable (3)
Significance	Low for the community as a whole (24)	Low for the community as a whole (21)
Status	Negative	Negative
Reversibility	No in case of HIV and AIDS	No in case of HIV and AIDS
Irreplaceable loss of resources?	Yes, if people contract HIV/AIDS. Human capital plays a critical role in communities that rely on farming for their livelihoods	

Can impact be mitigated?	Yes, to some degree. However, the risk cannot be eliminated	
Mitigation: See below		
Cumulative impacts: Impacts on family and community relations that may, in some cases, persist for a long period of time. Also in cases where unplanned / unwanted pregnancies occur or members of the community are infected by an STD, specifically HIV and or AIDS, the impacts may be permanent and have long term to permanent cumulative impacts on the affected individuals and/or their families and the community.		
Residual impacts: Residual impacts would include costs to local individuals and families associated with having to raised children from unplanned pregnancies, costs associated with living with STD, specifically HIV/AIDs, and costs associated with becoming dependent on drugs and or alcohol		

4.3.3 Influx of job seekers

Large construction projects tend to attract people to the area in the hope that they will secure a job, even if it is a temporary job. These job seekers can in turn become "economically stranded" in the area or decide to stay on irrespective of finding a job or not. 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.

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 may therefore be greater.

However, the potential for economically motivated in-migration and subsequent labour stranding in the area linked to the proposed project is likely to be low. As indicated above, the towns of Vredenburg and Saldanha Bay are not small, rural towns, and have experienced a significant influx of job-seekers and over the last 10-15 years linked to the development of the area, including the establishment of the Industrial Development Zone (IDZ) in Saldanha. The establishment of a 140 MW WF is not sufficiently large to result in an additional influx of job-seekers to the area. The risks associated with job seekers staying on in Vredenburg, Saldanha Bay and Paternoster are, therefore, likely to be low.

Table 4.3: Assessment of impact of job seekers on local communities associated with the construction phase

Nature: Potential impacts on family structures, social networks and community services associated with the influx of job seekers		
	Without Mitigation	**With Mitigation**
Extent	Local (2)	Local (1)
Duration	Permanent (5) (For job seekers that stay on the town)	Permanent (5) (For job seekers that stay on the town)
Magnitude	Minor (2)	Minor (2)
Probability	Probable (3)	Probable (3)
Significance	Low (27)	Low (24)
Status	Negative	Negative
Reversibility	No in case of HIV and AIDS	No in case of HIV and AIDS
Irreplaceable loss of resources?	Yes, if people contract HIV/AIDS. Human capital plays a critical role in communities that rely on farming for their livelihoods	
Can impact be mitigated?	Yes, to some degree. However, the risk cannot be eliminated	
Mitigation: See below		
Cumulative impacts: Impacts on family and community relations that may, in some cases, persist for a long period of time. Also in cases where unplanned / unwanted pregnancies occur or members of the community are infected by an STD, specifically HIV and or AIDS, the impacts may be permanent and have long term to permanent cumulative impacts on the affected individuals and/or their families and the community.		
Residual impacts: Impacts on family and community relations that may, in some cases, persist for a long period of time. Also in cases where unplanned / unwanted pregnancies occur or members of the community are infected by an STD, specifically HIV and or AIDS, the impacts may be permanent and have long term to permanent impacts on the affected individuals and/or their families and the community.		

4.3.4 Risk to safety, livestock, farm infrastructure and farming operations

The presence on and movement of construction workers on and off the site may pose a potential safety threat to local famer's and farm workers in the vicinity of the site threat. In addition, farm infrastructure, such as fences and gates, may be damaged and stock losses may also result from gates being left open and/or fences being damaged or stock theft linked either directly or indirectly to the presence of farm workers on the site. The local farmers in the area interviewed indicated that the presence of construction workers on the site increased the exposure of their farming operations and livestock to the outside world, which, in turn, increased the potential risk of stock theft and crime. In this regard stock theft is a problem on farms adjacent to public roads in the study area, specifically the Paternoster, Stompneusbaai and Skuitjiesklip roads. Farms accessed off the Koppiesveld road are less at risk due to being more secluded.

Table 4.4: Assessment of risk to safety, livestock, infrastructure and farming operations

Nature: Potential risk to safety of farmers and farm workers, livestock, damage to farm infrastructure and farming operations associated with the construction related activities and presence of workers on the site		
	Without Mitigation	**With Mitigation**
Extent	Local (3)	Local (2)
Duration	Short term (2)	Short term (2)
Magnitude	Medium (6)	Low (4)
Probability	Probable (3)	Probable (3)
Significance	Medium (33)	Low (24)
Status	Negative	Negative
Reversibility	Yes, compensation paid for stock losses and damage to farm infrastructure etc.	Yes, compensation paid for stock losses and damage to farm infrastructure etc.
Irreplaceable loss of resources?	No	No
Can impact be mitigated?	Yes	Yes
Mitigation: See below		
Cumulative impacts: No**,** provided losses are compensated for.		
Residual impacts: None**,** provided losses are compensated for.		

4.3.5 Increased fire risk

The presence of construction workers and construction-related activities on the site poses an increased fire risk, which could, in turn, pose a threat to crops, livestock, and farmsteads in the area. In the process, farm infrastructure may also be damaged or destroyed and human lives threatened. Grass fires would pose a threat to wheat crops, which in turn, would have a significant impact on the livelihoods of local farmers should their crops and or livestock be affected. The potential fire risk of grass fires is highest towards the end of the winter months (October-November) when the wheat crops have ripened and are ready for harvesting. This period also coincides with dry, windy conditions in the area.

Table 4.5: Assessment of impact of increased risk of fires

Nature: Potential loss of livestock, crops and houses, damage to farm infrastructure and threat to human life associated with increased incidence of fires		
	Without Mitigation	**With Mitigation**
Extent	Local (4)	Local (2)
Duration	Short term (2)	Short term (2)
Magnitude	High due to reliance on agriculture for maintaining livelihoods (8)	Low (4)
Probability	Probable (3)	Probable (3)
Significance	Medium (42)	Low (24)
Status	Negative	Negative
Reversibility	Yes, compensation paid for crop and stock losses etc.	Yes, compensation paid for crop and stock losses etc.
Irreplaceable loss of resources?	No	No
Can impact be mitigated?	Yes	
Mitigation: See below		
Cumulative impacts: No, provided losses are compensated for.		
Residual impacts: See cumulative impacts.		

4.3.6 Impacts associated with construction vehicles

The movement of heavy construction vehicles during the construction phase has the potential to damage local farm roads and create dust and safety impacts for other road users in the area and also impact on farming activities. The project components are likely to be transported to the site via the N7, R45 and or R27, all of which are important commercial and tourist routes. At a local, site specific level, access to the site is likely to be via the Paternoster Road (MR 240), Stompneus Bay Road and Koppiesveld Road. The latter two roads are gravel roads. The Koppiesveld road provides access to the WC01 WF site as well as a number of farms located in the area between the coastal range of hills and the Stompneusbaai Road. These include Soldatepos, Skuitjies and Fransvlei. The southern portion of the road was used during the construction of the WC01 WF. The damage to gravel roads by heavy equipment can result in a number of potential negative impacts, including increased wear on vehicles owned by local farmers, impact on ease of access (e.g. time delays, detours), as well as access to local towns (services, retail, socializing).

While traffic volumes along these roads are low during the week they increase over weekends due to visitors to the area. The transport of components of the WF to the site therefore has the potential to impact on other road users travelling along these roads. Measures will need to be taken to ensure that the potential impact on motorist using these roads is minimised. The potential impacts on tourists and locals can be effectively mitigated by restricting construction traffic movements to weekdays, and,

where possible, limiting activities during the flower season months of August and September.

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

Nature: Potential safety, dust etc. and damage to road surfaces associated with movement of construction related traffic to and from the site		
	Without Mitigation	**With Mitigation**
Extent	Local (3)	Local (1)
Duration	Short Term (2)	Short Term (2)
Magnitude	Medium (6)	Minor (2)
Probability	Highly Probable (4)	Probable (3)
Significance	Medium (44)	Low (15)
Status	Negative	Negative
Reversibility	Yes	
Irreplaceable loss of resources?	No	No
Can impact be mitigated?	Yes	
Mitigation: See below		
Cumulative impacts: If damage to roads is not repaired then this will affect the farming activities in the area and result in higher maintenance costs for vehicles of local farmers and other road users. The costs will be borne by road users who were no responsible for the damage.		
Residual impacts: See cumulative impacts		

4.3.7 Impacts associated with loss of farmland

Activities such as the establishment of access roads, the movement of heavy vehicles, the establishment of lay-down areas and foundations for the wind turbines, as well as the establishment of substations and power lines will potentially damage topsoil and vegetation. The compaction of soils associated with movement of heavy vehicles and other construction related activities does pose a potential threat to the productivity of the affected farms. However, mechanical ploughing and scarifying can mitigate the damage caused by compaction. Minimising the footprint of construction related activities could also mitigate the damage to farmland, and ensuring that disturbed areas are actively rehabilitated upon completion of the construction phase.

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

Nature: The activities associated with the construction phase, such as establishment of access/haul roads, the movement of heavy vehicles, the establishment of lay-down areas and foundations for the wind turbines, substations and power lines will potentially damage topsoils and vegetation and result in damage to productive soils.		
	Without Mitigation	**With Mitigation**
Extent	Local (2)	Local (1)
Duration	Long term-permanent if disturbed areas are not rehabilitated (5)	Short term if damaged areas are rehabilitated (1)
Magnitude	Low (4)	Minor (2)
Probability	Highly Probable (4)	Highly Probable (4)
Significance	Medium (44)	Low (16)
Status	Negative	Negative
Reversibility	Yes, but long period required	Yes, but long period required
Irreplaceable loss of resources?	No. Affected land can be restored, provided appropriate rehabilitation is implemented.	
Can impact be mitigated?	Yes, provided efficient site rehabilitation is carried out, and the movement of heavy loads on the site are strictly limited to designated on-site roads and construction areas. .	
Mitigation: See below		
Cumulative impacts: The impacts would occur on land not currently affected by similar impacts. No additional impacts to the West Coast One development are currently proposed on the relevant properties. No cumulative impacts are therefore associated with the development.		
Residual impacts: Potential localised deep soil computation resulting from the movement of abnormally heavy equipment and components.		

4.4 OPERATION PHASE IMPACTS

Based on the findings from the SIA undertaken for the previous WF proposed for the site the key social issues affecting the operation phase are likely to include:

Potential positive impacts

- The establishment of renewable energy infrastructure and generation of clean, renewable energy;
- Creation of employment and business opportunities. The operation phase will also create opportunities for skills development and training;
- Benefits associated with the establishment of a Community Trust.

Potential negative impacts

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

4.4.1 Development of renewable energy infrastructure

The establishment of renewable energy infrastructure, such as the proposed WF, should be viewed, firstly within the context of the South Africa's current reliance on coal powered energy to meet the majority of its energy needs, and secondly, within the context of the success of the REIPPPP.

Impact of a coal powered economy

The Green Jobs study (2011) notes that South Africa has one of the most carbon-intensive economies in the world, thus making the greening of the electricity mix a national imperative. Within this context the study notes that the green economy could be an extremely important trigger and lever for enhancing a country's growth potential and redirecting its development trajectory in the 21st century. The study also identifies a number of advantages associated with wind power as a source of renewable energy with a large 'technical' generation potential. In this regard wind energy does not emit carbon dioxide (CO_2) in generating electricity and is associated with exceptionally low lifecycle emissions. The construction period for a wind farm is much shorter than that of conventional power stations, while an income stream may in certain instances be provided to local communities through employment and land rental. The study also notes that the greenhouse gases (GHG) associated with the construction phase are offset within a very short period of time compared with the project's lifespan. Wind power therefore provides an ideal means for reaching emission reduction targets in a relatively easy manner. In addition, and of specific relevance to South Africa, wind as energy source is not dependent on water (as compared to the massive water requirements of conventional power stations), has a limited footprint and therefore does not impact on large tracts of land, poses limited pollution and health risks, specifically when compared to coal and nuclear energy plants.

The Greenpeace Report (powering the future: Renewable Energy Roll-out in South Africa, 2013), notes that within a broader context of climate change, coal energy does not only have environmental impacts, it also has socio-economic impacts. Acid mine drainage from abandoned mines in South Africa impacts on water quality and poses the biggest threat to the country's limited water resources. Huge volumes of water are also required to wash coal and cool operating power stations. Eskom uses an estimated 10 000 litres of water per second due to its dependency on coal (Greenpeace, 2012).

Benefits associated with REIPPPP

The overview of the IPPPP (2016) indicates that the REIPPPP has attracted R53.4 billion in foreign investment and financing in the six bid windows (BW1 – BW4 and 1S2). This is more than double the inward FDI attracted into South Africa during 2015 (R22.6 billion). In terms of local equity shareholding, 47% (R31.5 billion) of the total equity shareholding (R66.7 billion) was held by South African's across BW1 to BW4 and BW1S2. This equates to substantially more than the 40% requirement. As far as Broad Based Black Economic Empowerment is concerned, Black South Africans own, on average, 31% of projects that have reached financial close, which is slightly above the 30% target.

The total projected procurement spend for during the construction phase was R73 billion, more than the projected operations procurement spend over the 20 years operational life (R70 billion). The combined (construction and operations)

procurement value for BW1 to BW4 and 1S2 is projected as R142.9 billion, of which R44.3 billion has been spent to date. For construction, of the R41.8 billion already spent to date, R32.5 billion is from the 51 projects which have already been completed. These 51 projects had planned to spend R30.1 billion. The actual procurement construction costs have therefore exceeded the planned costs by 8% for completed projects. Of the R41.8 billion spent on procurement during construction, R37.2 billion has reportedly been procured from BBBEE suppliers, achieving 89% of total procured. Actual BBBEE spend during construction for BW1 and BW2 alone was R25.5 billion. The R37.2 billion spent on BBBEE during construction already exceeded the R33.9 billion that had originally been anticipated by IPPs.

The report notes that for a programme of this magnitude, with construction procurement spend alone estimated at R73 billion, the result is a substantial stimulus for establishing local manufacturing capacity. The report also notes that the strategy has prompted several technology and component manufacturers to establish local manufacturing facilities. The report also notes that this will improve with greater certainty relating to subsequent bid windows and further determinations will continue to build on these successes.

In terms of employment, to date, a total of 28 4842 job years[26] have been created for South African citizens, of which 26 207 were in construction and 2 276 in operations. Black South African citizens, youths and rural or local communities have been the major beneficiaries during the construction phases, as they respectively represent 80%, 41% and 52% of total job opportunities created by IPPs to date. These job years should rise further past the planned target as more projects enter the construction phase. The REIPPPP has also ensured that black people in local communities have ownership in the IPP projects that operate in or nearby their vicinities. On average, black local communities own 11% of projects that have reached financial close. This is well above the 5% target.

The WWF (2014) study also notes that the REIPPPP requirement of 30% allocated to the local economic development has ensured that non-price criteria linked to socio-economic upliftment have a much heavier weighting than they would normally enjoy under Government's preferential procurement policy (WWF, 2014).

The establishment of renewable energy facilities, such as the proposed WF, therefore not only address the environmental issues associated with climate change and consumption of scarce water resources, but also creates significant socio-economic opportunities and benefits, specifically for historically disadvantaged, rural communities.

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

Table 4.8: Implementation of clean, renewable energy infrastructure

Nature: Development of infrastructure to generate clean, renewable energy		
	Without Mitigation	**With Mitigation**
Extent	Local, Regional and National (4)	Local, Regional and National (5)
Duration	Long term (4)	Long term (4)
Magnitude	High (8)	High (8)
Probability	Highly Probable (4)	Definite (5)
Significance	High (64)	High (85)
Status	Positive	Positive
Reversibility	Yes	
Irreplaceable loss of resources?	Yes, impact of climate change on ecosystems	
Can impact be mitigated?	Yes	
Enhancement: See below		
Cumulative impacts: Overall reduction in CO_2 emission, reduction in water consumption for energy generation, contribution to establishing an economically viable commercial renewables generation sector in the Western Cape and South Africa.		
Residual impacts: See cumulative impacts		

4.4.2 Creation of employment and business opportunities and support for local economic development

Based on information from other wind projects the establishment of a 140 MW WF would create ~ 28 employment opportunities for over a 20 year period. Of this total approximately 12 will be low skilled, 8 semi-skilled and 2 high skilled positions. The annual wage bill for the operational phase would be ~ R 2.5 million. The majority of employment opportunities associated with the operational phase is likely to benefit HD members of the community. 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 employment and skills development contained in the WCDM and SBLM. As indicated above, the SBLM support development that creates employment and skills development opportunities.

At this stage it is unclear where the permanent staff will reside. However, a number of people are likely to be located in Vredenburg, Saldanha or the coastal settlements in the study area, such as Paternoster. A percentage of permanent employees who are not locally based may purchase houses in one of these towns, while others may decide to rent. Both options would represent a positive economic benefit for the region. In addition, a percentage of the monthly wage bill earned by permanent staff would be spent in the regional and local economy. This will benefit local businesses

in the relevant towns. The benefits to the local economy will extend over the anticipated 20 year operational lifespan of the project.

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

Procurement during the operational phase will also create opportunities for the local economy and businesses. In this regard the overview of the IPPPP (2016) notes that the procurement spend over the 20 year operational phase for BW1 to BW4 and 1S2 will be in the region of R 70 billion. The Green Jobs study (2011) also found that energy generation is expected to become an increasingly important contributor to green job creation over time, as projects are constructed or commissioned. The study notes that largest gains are likely to be associated with operations and maintenance (O&M) activities. In this regard, operations and maintenance employment linked to renewable energy generation plants will also be substantial in the longer term.

The establishment of WFs, such as the proposed WF, also support the development of a green energy manufacturing sector in South Africa. Manufacturing segments with high employment potential in the long term would include suppliers of components for wind farms, such as Gestamp in Atlantis. The Green Jobs study (2011) found that South Africa is in a position to leverage upon some of its existing manufacturing capacities in order to produce components and parts for various sections of wind turbines, especially those industries involved in the production of steel and metal products, as well as the boat building and electrical industries. Local manufacturing capacity can be promoted through engagement with established global manufacturers. The study does however note that critical mass would have to be developed in order to obtain economies of scale. The establishment of WFs, such as the proposed WF, would therefore contribute to achieving this critical mass.

The study also found that there was also significant potential for local involvement in the wind sector. Local companies can also exploit market opportunities in other African countries with higher wind power potential. This would create additional opportunities for improving economies of scale and enhancing the local industry's chances to succeed.

Table 4.9: Impact assessment of employment and business creation opportunities[27]

Nature: Creation of employment and business opportunities associated with the operational phase.		
	Without Mitigation	**With Enhancement**
Extent	Local, Regional and National (3)	Local, Regional and National (4)
Duration	Long term (4)	Long term (4)
Magnitude	Low (4)	Moderate (6)
Probability	Highly Probable (4)	Highly Probable (4)
Significance	Medium (44)	Medium (56)
Status	Positive	Positive
Reversibility	N/A	
Irreplaceable loss of resources?	No	
Can impact be enhanced?	Yes	
Enhancement: See below		
Cumulative impacts: Creation of permanent employment and skills and development opportunities for members from the local community and creation of additional business and economic opportunities		
Residual impacts: See cumulative impacts		

4.4.3 Benefits associated with the establishment of a Community Trust

An important focus of the REIPPPP is to ensure that the build programme secures sustainable value for the country and enables local communities to benefit directly from the investments attracted into the area. In this regard IPPs are required to contribute a percentage of projected revenues accrued over the 20 year project operational life toward socio-economic development (SED) initiatives. These contributions are linked to Community Trusts and accrue over the 20 year project operation life and are used to invest in housing and infrastructure as well as healthcare, education and skills development.

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 WF plant can be used to support a number of social and economic initiatives in the area, including:

- Creation of jobs;
- Education;

[27] An economic modelling technique will be utilised in order to quantify the impact on employment and business opportunities. This will be undertaken as a separate economic assessment in the EIA phase. The proposed terms of reference are contained in Annexure E.

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

The minimum compliance threshold for SED contributions is 1% of revenue with 1.5% the targeted level over the 20 year project operational life. The 51 projects that are currently operational have contributed R256 to SED to date, which represents approximately 1.2% of total revenue generated to date. The 51 IPP projects have also committed 1.5% over the 20 year project operational life. Therefore, based on current projects average commitment level is 2.2% or 120% more than the minimum compliance threshold (IPPP Overview, 2016).

The 2016 IPPP Overview notes that to date (across 6 bid windows) a total contribution of R19.3 billion has been committed to SED initiatives. Of the total commitment, R15.2 billion is specifically allocated for local communities where the IPPs operate. With every new IPP on the grid, revenues and the respective SED contributions will increase.

The Green Jobs study (2011), found that the case for wind power is enhanced by the positive effect on rural or regional development. Wind farms located in rural areas create an opportunity to benefit the local and regional economy through the creation of jobs and tax revenues. The findings of the thesis by Tait (2012) also note that the distributed nature of renewable energy generation can induce a more geographically dispersed pattern of development. As a result renewable energy sites can be highly suited to rural locations with otherwise poor potential to attract local inward investment thus able to target particularly vulnerable areas. In her conclusion Tait notes that thesis found positive evidence for the establishment of community benefit schemes in the wind sector in South Africa. The BBBEE requirements for developers as set out in the DoE's IPPPP for renewables was the primary driver for such schemes. The procurement programme, in keeping with the objective of maximising the economic development potential from this new sector, includes a specific focus on local communities in which wind farms are located.

In addition to the benefits for local communities, the establishment of a WF has a limited impact on the current agricultural land uses that underpin the local economic activities in the area and does consume negligible volumes of water during the operational phase.

Based on the findings of the review it is clear that the establishment of Community Trusts associated with renewable energy projects create significant benefits for local rural communities. The benefits to the local HD communities in the area should also be viewed within the context of the collapse of the fishing industry over the last 10-15 years.

Table 4.10: Assessment of benefits associated with establishment of community trust

Nature: Establishment of a community trust funded by revenue generated from the sale of energy. The revenue can be used to fund local community development		
	Without Mitigation	**With Enhancement[28]**
Extent	Local and Regional (2)	Local and Regional (3)
Duration	Long term (4)	Long term (4)
Intensity	Low (4)	Moderate (6)
Likelihood	Probable (3)	Definite (5)
Reversibility	Medium (30)	High (65)
Irreplaceable loss of resources?	Positive	Positive
Significance		
Status	No	
Can impact be enhanced?	Yes	
Enhancement: See below		
Cumulative impacts: Promotion of social and economic development and improvement in the overall well-being of the community		
Residual impacts: See cumulative impacts		

4.4.4 Impact on sense of place and rural character of the landscape

The potential visual impact on the areas sense of place and rural character was raised as a key concern by a large number of key stakeholders interviewed as part of the previous SIA, specifically some residents from Britannica Heights and Paternoster. Some residents from Paternoster have also raised concerns regarding visual impacts. However, a number stakeholders interviewed, including residents from Paternoster, also indicated that they did not believe that the wind turbines associated with WF's in the area resulted in negative visual impact. The visual impacts were also linked to impact on quality of life and property values. The impact on property values is discussed in more detail in Section 4.4.5. An assessment of the significance will be informed by the findings of the Visual Impact Assessment (VIA) undertaken during the Assessment Phase.

[28] Enhancement assumes effective management of the community trust

Table 2.12: Assessment of visual impact on sense of place[29]

Nature: Visual impact associated with the proposed WF and the potential impact on the areas rural sense of place and character		
	Without Mitigation	**With Mitigation**
Extent		
Duration		
Magnitude		
Probability		
Significance		
Status	Negative	Negative
Reversibility	Yes	
Irreplaceable loss of resources?	No, facility can be removed.	No, facility can be removed.
Can impact be mitigated?		
Mitigation: See below		
Cumulative impacts: Contribute to cumulative visual impact on the on current rural sense of place		
Residual impacts: None as the visual impact would be removed with the decommissioning of the facility		

4.4.5 Potential impact on property values

The potential impact of the proposed IPD WF on property values was raised as a key concern, specifically by residents of Britannica Heights and Paternoster. A literature review was undertaken as part of the SIA. It should be noted that the review does not constitute a property evaluation study and merely seeks to comment on the potential impact of wind farms on property values based on the findings of studies undertaken overseas.

In total five articles were identified and reviewed namely:

- Stephen Gibbons (April, 2014): Gone with the wind: Valuing the Visual Impacts of Wind turbines through house prices. London School of Economics and Political Sciences & Spatial Economics Research Centre, SERC Discussion Paper 159;
- Review of the Impact of Wind Farms on Property Values, Urbis Pty Ltd (2016): Commissioned by the Office of Environment and Heritage, NSW, Australia;
- Yasin Sunak and Reinhard Madlener (May 2012): The Impact of Wind Farms on Property Values: A Geographically Weighted Hedonic Pricing. School of Business and Economics / E.ON Energy Research Center, RWTH Aachen University. Model Working Paper No. 3/2012;

[29] Significance will be assessed based on VIA findings

- Martin D. Heintzelman and Carrie M. Tuttle (March 3, 2011): Values in the Wind: A Hedonic Analysis of Wind Power Facilities. Economics and Financial Studies School of Business, Clarkson University;
- Ben Hoen, Jason P. Brown, Thomas Jackson, Ryan Wiser, Mark Thayer and Peter Cappers (August 2013): A Spatial Hedonic Analysis of the Effects of Wind Energy Facilities on Surrounding Property Values in the United States. Ernest Orlando Lawrence Berkeley National Laboratory.

The literature reviewed was based on an attempt by the authors of the SIA to identify what appear to be "academically and or scientifically" based studies that have been undertaken by reputable institutions post 2010. However, the literature review does not represent an exhaustive review. The key findings of the literature review are summarised below.

Stephen Gibbons (April, 2014)
The overall findings of the study indicate that wind farms reduce house prices in postcodes where the turbines are visible, and reduce prices relative to postcodes close to wind farms where the wind farms are not visible. The overall finding is that "averaging over wind farms of all sizes, this price reduction is around 5-6% within 2km, falling to less than 2% between 2 and 4km, and less than 1% by 14km which is at the limit of likely visibility". The study notes that small wind farms have no impact beyond 4km, whereas the largest wind farms (20+ turbines) reduce prices by 12% within 2km, and reduce prices by small amounts right out to 14km (by around 1.5%).

Martin D. Heintzelman and Carrie M. Tuttle (March, 2011)
The findings of the study indicate that nearby wind facilities significantly reduce property values. In this regard, based on the repeat sales model, the construction of turbines within 0.5 miles (0.8 km) of the property resulted in a 10.87%-17.77% decline in sales price depending on the initial distance to the nearest turbine and the particular specification. At a distance of 1 mile (1.6km) (about 20% of the sample), the decline in value was between 7.73% and 14.87%. The study notes that from a policy perspective, these results indicate that there is a need to compensate local homeowners/communities for allowing wind development within their borders.

The paper concludes that the results of the study appear to indicate that proximity to wind turbines does have a negative and significant impact on property values. Importantly, the best and most consistent measure of these effects appears to be the simple, continuous, proximity measure, the (inverse distance) to the nearest turbine.

Ben Hoen, et al (August 2013)
The study was based on data from more than 50 000 home sales among 27 counties in nine states of the USA. The homes were located within 10 miles of 67 different wind facilities, and 1 198 sales were within 1 mile (1.6 km) (331 of which were within a half mile (0.8km)) of a turbine. The findings of the study indicated that across all model specifications, there was no statistical evidence that home prices near wind turbines were affected in either the post-construction or post-announcement/pre-construction periods. Therefore, if effects do exist, either the average impacts are relatively small (within the margin of error in the models) and/or sporadic (impacting only a small subset of homes). In addition, the sample

size and analytical methods enabled the study to bracket the size of effects that would be detected, if those effects were present at all.

Based on the results, the study found that it is *highly unlikely* that the actual average effect for homes that sold in the sample areas within 1 mile of an existing turbine is larger than +/-4.9%. In other words, the average value of these homes could be as much as 4.9% higher than it would have been without the presence of wind turbines, as much as 4.9% lower, the same (i.e., zero effect), or anywhere in between. Similarly, it is highly unlikely that the average actual effect for homes sold in the sample area within a half mile of an existing turbine is larger than +/-9.0%. In other words, the average value of these homes could be as much as 9% higher than it would have been without the presence of wind turbines, as much as 9% lower, the same (i.e., zero effect), or anywhere in between. The study notes that, regardless of these potential maximum effects, the core results of the study consistently show no sizable statistically significant impact of wind turbines on nearby property values.

Urbis Pty Ltd (2016)

Based on the outcome of the study the authors were of the opinion that wind farms may not significantly impact rural properties used for agricultural purposes. However, the study found that there is limited available sales data to make a conclusive finding relating to value impacts on residential or lifestyle properties located close to wind farm turbines, noting that wind farms in NSW have been constructed in predominantly rural areas. In conclusion, the authors of the Urbis study found:

- Appropriately located wind farms within rural areas, removed from higher density residential areas, are unlikely to have a measurable negative impact on surrounding land values;
- There is limited available sales data to make a conclusive finding relating to value impacts on residential or lifestyle properties located close to wind farm turbines, noting that wind farms in NSW have been constructed in predominantly rural areas.

Comment on findings of the literature review

The most comprehensive study appears to the study by Gibbons (2014), which found that "averaging over wind farms of all sizes" the price reduction was around 5-6% within 2km, falling to less than 2% between 2 and 4km, and less than 1% by 14km which is at the limit of likely visibility. The properties that stand to be most affected are those located in Britannica Heights. The potential impact will influenced by the distance of wind turbines. This will be assessed as part of the assessment phase.

Table 4.13: Assessment of potential impact on property values[30]

Nature: Potential impact on property values due to visual impact associated with the proposed WF.		
	Without Mitigation	**With Mitigation**
Extent		
Duration		
Magnitude		
Probability		
Significance		
Status		
Reversibility	Yes	
Irreplaceable loss of resources?	No, facility can be removed.	No, facility can be removed.
Can impact be mitigated?		
Mitigation: See below		
Cumulative impacts: Contribute to cumulative visual impact on the on current rural sense of place		
Residual impacts: None as the visual impact would be removed with the decommissioning of the facility		

4.4.6 Potential impact on tourism

The potential impact of the proposed WF was raised as a key concern by the tourism related operations in Paternoster, as well as Saldanha Bay Tourism and the WCDM planner interviewed as part of the previous SIA. A review of international literature in the impact of wind farms was undertaken as part of the SIA. The key findings are summarised below. Three articles were reviewed, namely:

- Atchison, (April, 2012). Tourism Impact of Wind Farms: Submitted to Renewables Inquiry Scottish Government. University of Edinburgh
- Glasgow Caledonian University (2008). The economic impacts of wind farms on Scottish tourism. A report prepared for the Scottish Government
- Regeneris Consulting (2014). Study into the Potential Economic Impact of Wind Farms and Associated Grid Infrastructure on the Welsh Tourism Sector

[30] The significance rating will be undertaken as part of the Assessment Phase and will be informed by the VIA and the location of wind turbines relative to the affected properties. In order to quantify the impact on the Boulders Wind Farm on the property values a separate study will be undertaken within the area that will include a review and analysis of case studies and trends in property prices, , specifically the trend experienced prior to and after completion of the existing operational West Coast One Wind Energy Facility (current status quo of the area). The proposed terms of reference are contained in Annexure E.

The research by Aitchison (2012) found that that previous research from other areas of the UK has demonstrated that wind farms are very unlikely to have any adverse impact on tourist numbers (volume), tourist expenditure (value) or tourism experience (satisfaction) (Glasgow Caledonian University, 2008; University of the West of England, 2004). In addition, to date, there is no evidence to demonstrate that any wind farm development in the UK or overseas has resulted in any adverse impact on tourism. In conclusion, the findings from both primary and secondary research relating to the actual and potential tourism impact of wind farms indicate that there will be neither an overall decline in the number of tourists visiting an area nor any overall financial loss in tourism-related earnings as a result of a wind farm development.

In addition, all of the studies that have sought to predict impact have demonstrated that any negative impact of wind farms on tourism will be more than outweighed by the increase in tourists that are attracted by wind farms, by the increase in employment brought about by the development of wind farms and/or by the continuing growth of tourism. The study by the Glasgow Caledonian University (2008) found that only a negligible fraction of tourists will change their decision whether to return to Scotland as a whole because they have seen a wind farm during their visit.

The study also found that 51.0% of respondents indicated that they thought wind farms could be tourist attractions. In this regard the visitor centre at the Whitelee Wind Farm in east Ayrshire Scotland run by ScottishPower Renewables has become one of the most popular 'eco-attractions' in Scotland, receiving 200 000 visitors since it opened in 2009.

The study by Regeneris Consulting (2014) found that there was no evidence that wind farms would deter tourists from traveling along designated visitor or tourists routes. The study indicated that small minorities of visitors would be encouraged, whilst others would be discouraged. Overall, however, there was no evidence to suggest that there would be any significant change in visitor numbers using these routes to reach destination elsewhere.

The study also found that in more sensitive locations the potential negative effect on visitor numbers may still be low overall, but in some circumstances could be moderate. The greatest concern exists amongst areas and businesses closest to wind farms and appealing to visitor markets most sensitive to changes in landscape quality.

Based on the findings of the literature review there is limited evidence to suggest that the proposed WF would impact on impact on the areas tourism industry, specifically Paternoster. The findings also indicate that wind farms do not impact on tourist routes. This is despite the concerns raised by the representatives from the tourism sector interviewed.

Table 4.14: Impact on tourism[31]

Nature: Potential impact of the wind energy facility on local tourism.		
	Without Mitigation	**With Enhancement / Mitigation**
Extent	Local (2)	Local (3)
Duration	Long term (4)	Long term (4)
Magnitude	Low (2)	Low (2)
Probability	Probable (3)	Probable (3)
Significance	Low (24) (Applies to both – and +)	Low (27) (Applies to both – and +)
Status	Negative (Potential to distract from the tourist experience of the area) Positive (Potential to attract people to the area)	Negative (Potential to distract from the tourist experience of the area) Positive (Potential to attract people to the area)
Reversibility	Yes	
Irreplaceable loss of resources?	No	
Can impact be enhanced?	Yes	
Enhancement: See below		
Cumulative impacts: Potential benefit for tourism in the SBLM (+). Potential for reduced number of tourist visits to the area, which in turn would impact on local tourism sector (-)		
Residual impacts: See cumulative impacts		

4.5 ASSESSMENT OF DECOMMISSIONING PHASE

Typically, the major social impacts associated with the decommissioning phase are linked to the loss of jobs and associated income. This has implications for the households who are directly affected, the communities within which they live, and the relevant local authorities. However, in the case of the proposed facility the decommissioning phase is likely to involve the disassembly and replacement of the existing components with more modern technology. This is likely to take place in the 20 - 25 years post commissioning. The decommissioning phase is therefore likely to create additional, construction type jobs, as opposed to the jobs losses typically associated with decommissioning. The number of people employed during the operational phase of a single 140 MW WF will be in the region of 28. Given the relatively low number of people employed during the operational phase the

[31] The significance ratings will be confirmed during the Assessment Phase. A trend analysis of the tourist activities will be considered as part of a separate study undertaken during the EIA phase, specifically the trend experienced prior to and after completion of the existing operational West Coast One Wind Energy Facility (current status quo of the area). The proposed terms of reference are contained in Annexure E.

decommissioning of the facility is unlikely to have a significant negative social impact on the local community. The potential impacts associated with the decommissioning phase can also be effectively managed with the implementation of a retrenchment and downscaling programme.

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

Table 4.15: Impacts associated with decommissioning

Nature: Social impacts associated with the decommissioning phase are linked to the loss of jobs and associated income		
	Without Mitigation	**With Mitigation**
Extent	Local (2)	Local (1)
Duration	Short term depending on how long affected staff take to find alternative employment (2)	Short term (2)
Magnitude	Low (2)	Low (2)
Probability	Highly Probable (4)	Highly Probable (4)
Significance	Low (24)	Low (27) (Applies to both – and +)
Status	Negative	Negative
Reversibility	Yes	
Irreplaceable loss of resources?	N/A	
Can impact be mitigated?	Yes	
Mitigation: See below		
Cumulative impacts: Contribution of current high levels of unemployment in the area and associated social impacts		
Residual impacts: See cumulative impacts		

4.6 CUMULATIVE IMPACT ON SENSE OF PLACE

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. The key concerns in terms of cumulative impacts are 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. The relevant issues raised by the Scottish Natural Heritage Report include:

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

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

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

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.

There are a number of renewable energy projects, including 10 WFs, proposed within a 50 km radius of the study area, including WFs at Darling, Hopefield and Velddrift. The potential for cumulative impacts associated with combined visibility (whether two or more wind energy facilities will be visible from one location) and sequential visibility (e.g. the effect of seeing two or more wind energy facilities along a single journey, e.g. road or walking trail) is therefore high. This should also be viewed within the context of the areas importance as a tourist destination. The assessment of the potential cumulative impact will be informed by the VIA undertaken as part of the Assessment Phase.

Table 4.16: Cumulative impacts on sense of place and the landscape[32]

Nature: Cumulative visual impact associated with the proposed WF and the potential impact on the areas rural sense of place and character		
	Without Mitigation	**With Mitigation**
Extent		
Duration		
Magnitude		
Probability		
Significance		
Status		
Reversibility	Yes	
Irreplaceable loss of resources?	No, facility can be removed.	No, facility can be removed.
Can impact be mitigated?		
Mitigation: See below		
Cumulative impacts: Contribute to cumulative visual impact on the on current rural sense of place		
Residual impacts: None as the visual impact would be removed with the decommissioning of the facility		

4.7 CUMULATIVE IMPACT ON LOCAL SERVICES AND ACCOMMODATION

The establishment of the proposed 140 MW Boulders WF and the other renewable energy facilities in the WCDM and SBLM may place pressure on local services, specifically medical, education and accommodation. This pressure will be associated with the influx of workers to the area associated with the construction and operational phases of renewable energy projects proposed in the area, including the proposed WF. The potential impact on local services can be mitigated by employing local community members. The presence of non-local workers during both the construction and operation phase will also place pressure on property prices and rentals. As a result, local residents, such as government officials, such as municipal workers, school teachers, and the police, may no longer be able to buy or afford to rent accommodation in towns such as Vredenburg, Saldnanha Bay and Paternoster.

However, both Vredenburg and Saldnanha Bay are established medium sized towns. The potential impacts on local service are therefore likely to be low, specifically given that the majority of the low and semi-skilled worker involved in renewable energy projects are likely to come from Vredenburg, Saldnanha Bay and other local towns in the area.

[32] Significance will be assessed based on VIA findings

In addition, all of the coastal towns have holiday houses that are available for rental. The impact on accommodation is therefore likely to be limited. In addition, as indicated below, this impact should also be viewed within the context of the potential positive cumulative impacts for the local economy associated with the establishment of renewable energy as an economic driver in the area. These benefits will create opportunities for investment in Vredenburg and Saldnanha Bay, including the opportunity to up-grade and expand existing services and the construction of new houses. In this regard the establishment of a renewable energy will create an opportunity for economic development in the area.

The Community Trusts associated with each project will also generate revenue that can be used by the WCDM and SBLM in consultation with the Western Cape Provincial Government, to invest in up-grading local services where required. In should also be noted that it is the function of national, provincial and local government to address the needs created by development and provide the required services. The additional demand for services and accommodation created by the establishment of development renewable energy projects should therefore be addressed in the Integrated Development Planning process undertaken by the WCDM and SBLM.

Table 4.17: Cumulative impacts on local services

Nature: The establishment of a number of renewable energy facilities has the potential to place pressure on local services, specifically medical, education and accommodation		
	Without Mitigation	**With Mitigation**
Extent	Local and regional (2)	Local and regional (1)
Duration	Medium term (3)	Medium term (3)
Magnitude	Low (4)	Low (4)
Probability	Probable (3)	Probable (3)
Significance	Low (27)	Low (24)
Status	Negative	Negative
Reversibility	Yes. WF components and other infrastructure can be removed.	
Irreplaceable loss of resources?	No	
Can impact be mitigated?	Yes	
Enhancement: See below		
Cumulative impacts: Pressure on local services that may impact on service delivery		
Residual impacts: See cumulative impacts		

4.8 CUMULATIVE IMPACT ON LOCAL ECONOMY

In addition to the potential negative impacts, the establishment of the proposed 140 MW WF and other renewable energy facilities in the area has the potential to result in

significant positive cumulative socio-economic opportunities for the region, which, in turn, will result in a positive social benefit. As indicated above, there are a large number of renewable energy projects proposed in the study area. The positive cumulative impacts include creation of employment, skills development and training opportunities, and downstream business opportunities. The Community Trusts associated with each project will also create significant socio-economic benefits.

The Overview of the IPPP (2016) confirms the benefits associated with renewable energy projects for local and regional economies. The total projected procurement spend for BW1 to BW4 and 1S2 during the construction phase was R73 billion, while the operational procurement over 20 years is estimated to be in the region of R70 billion. The reports notes that the construction spend of R73 billion has resulted in a substantial stimulus for establishing local manufacturing capacity. Actual local content spend reported for IPPs that have started construction amounts to R33.8 billion against a corresponding project value (as realised to date) of R66.6 billion. This means 51% of the project value has been locally procured, exceeding the 45% commitment from IPPs and the thresholds for BW1 – BW4. The report also notes that the REIPPPP has prompted several technology and component manufacturers to establish local manufacturing facilities.

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

Table 4.18: Cumulative impacts on local economy

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

4.9 ASSESSMENT OF NO-DEVELOPMENT OPTION

As indicated above, South Africa currently relies on coal-powered energy to meet more than 90% of its energy needs. As a result South Africa is one of the highest per capita producers of carbon emissions in the world and Eskom, as an energy utility, has been identified as the world's second largest producer carbon emissions. The No-Development option would represent a lost opportunity for South Africa to supplement is 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 significant negative social cost.

However, at a provincial and national level, it should be noted that the proposed WF development is not unique. In this regard, a significant number of other renewable energy developments are currently proposed in the Western Cape and other parts of South Africa. Foregoing the proposed establishment of WFs would therefore not necessarily compromise the development of renewable energy facilities in the Western Cape Province and or South Africa. However, the socio-economic benefits for local communities in the WCDM and SBLM would be forfeited.

Table 4.19: Assessment of no-development option

Nature: The no-development option would result in the lost opportunity for South Africa to supplement is current energy needs with clean, renewable energy		
	Without Mitigation	**With Mitigation[33]**
Extent	Local-Regional	Local-Regional
Duration	Long term	Long term
Intensity	Medium	Medium
Likelihood	Likely	Likely
Reversibility	High	High
Irreplaceable loss of resources?	N/A	N/A
Significance	Moderate	Moderate
Status	Negative	Positive
Can impact be mitigated?	Yes	
Mitigation: See below		
Cumulative impacts: Reduce carbon emissions via the use of renewable energy and associated benefits in terms of global warming and climate change.		
Residual impacts: See cumulative impacts		

[33] Assumes establishment of a Community Trust

Visual impacts and impact on sense of place
The potential visual impacts associated with the previous WF were identified as one of the key concerns. In this regard a number of stakeholders, specifically residents in Britannica Heights, raised concerns regarding visual impacts. A number of residents from Paternoster also raised concerns regarding visual impacts. These concerns are also likely to apply to the proposed Boulders WF. However, a number

4.10 SUMMARY OF CONSTTUCTION AND OPERATION PHASE IMPACTS

Table 4.1 summarises the significance of the impacts associated with the construction phase. The significance ratings will be confirmed during the assessment phase of the EIA. Detailed enhancement and mitigation measures will also be identified during the Assessment Phase.

Table 4.1: Summary of impacts associated with construction phase[34]

Impact	Significance No Mitigation/ Enhancement	Significance With Mitigation/ Enhancement
Creation of employment and business opportunities	Medium (+)	Medium (+)
Presence of construction workers and potential impacts on family structures and social networks	Medium (-)	Low (-)
Influx of job seekers	Low (-)	Low (-)
Increased risks to livestock and farming infrastructure associated with the construction related activities and presence of construction workers on the site	Medium (-)	Low (-)
Increased fire risk	Medium (-)	Low (-)
Impact of heavy vehicles and construction activities	Medium (-)	Low (-)
Impact on farming activities	Medium (-)	Low (-)

Table 4.2 summarises the significance of the impacts associated with the operation phase. The significance ratings will be confirmed during the assessment phase of the EIA. Detailed enhancement and mitigation measures will also be identified during the Assessment Phase.

[34] The significance ratings are based on the findings of the SIA undertaken for the previous WF in 2016. These findings will be confirmed during the assessment phase for the Boulders WF.

Table 4.2: Summary of impacts associated with operation phase[35]

Impact	Significance No Mitigation/ Enhancement	Significance With Mitigation/ Enhancement
Promotion of renewable energy projects	High (-)	High (+)
Creation of employment and business opportunities	Medium (+)	Moderate (+)
Establishment of Community Trust	Medium (+)	High (+)
Visual impact and impact on sense of place[36]		
Impact on property values	Low (-)	Low (-)
Impact on tourism	Low (- and +)	Low (- and +)

4.11 CONCLUSIONS

The development of the proposed Boulders WF will create employment and business opportunities for locals during both the construction and operation phases of the project. Based on experience with other WF projects, the negative impacts associated with the construction phase can be effectively mitigated if the recommended mitigation measures are implemented. The detailed mitigation measures will be outlined in the Social Impact Assessment Report (SIAR).

The establishment of a Community Trust will also benefit the local community. The proposed development will also represent an investment in clean, renewable energy infrastructure, which, given the negative environmental and socio-economic impacts associated with a coal based energy economy and the challenges created by climate change, represents a significant positive social benefit for society as a whole. A review of the Renewable Energy Independent Power Producers Procurement Programme (REIPPPP) indicates that the programme has resulted in significant socio-economic benefits, both at a national level and at a local, community level. These benefits are linked to foreign Direct Investment, local employment and procurement and investment in local community initiatives.

The key concerns identified during the SIA undertaken for the previous WF on the site relate to the visual impacts associated with the wind turbines and the potential impact on property values and tourism. These concerns were raised by property owners in Britannica Heights and Paternoster. These concerns will also apply to the proposed Boulders WF. A number of local residents interviewed as part of the SIA for the previous WF also indicated that they did not regard the wind farm as having a negative visual impact.

The potential impact on property values, specifically property values in Britannica Heights, will depend on the location and proximity of the wind turbines to residential areas. In terms of the potential impact on tourism, based on the literature review, there is limited evidence to suggest that the proposed WF would impact on the area's tourism industry. The findings also indicate that wind farms do not impact on tourist routes.

[35] The significance ratings are based on the findings of the SIA undertaken for the previous WF on the site. These findings will be confirmed during the assessment phase for the Boulders WF.
[36] Significance ratings will be informed by findings of VIA to be undertaken during the Assessment Phase.

The potential visual and cumulative impacts on the areas sense of place and assessment of significance will be informed by the findings of the VIA undertaken for the proposed Boulders WF as part of the Assessment Phase of the EIA.

4.12 APPROACH TO ASSESSING IMPACTS

The identification and assessment of social impacts will be guided by the Guidelines for specialist SIA input into EIAs adopted by DEA&DP in the Western Cape in 2007. The Guidelines are based on accepted international best practice guidelines, including the Guidelines and Principles for Social Impact Assessment (Inter-organizational Committee on Guidelines and Principles for Social Impact Assessment, 1994). The approach will include:

- Review of existing project information, including the Planning and Scoping Documents;
- Collection and review of reports and baseline socio-economic data on the area (IDPs, Spatial Development Frameworks etc.);
- Site visits and interviews with key stakeholders in the area including local land owners and authorities, local community leaders and councillors, local resident associations and residents, local businesses, community workers etc.;
- Identification and assessment of the key social issues and opportunities;
- Review of key specialist studies, including VIA and HIA;
- Preparation of a Social Impact Assessment (SIA) Report, including identification of mitigation/optimisation and management measures to be implemented.
- Finalisation SIA Report.

Annexure B contains the methodology that will be used to attach significance rankings to the assessment process.

ANNEXURE A

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ANNEXURE B

METHODOLOGY FOR THE ASSESSMENT OF POTENTIAL IMPACTS

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

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

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

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

S = Significance weighting
E = Extent
D = Duration
M = Magnitude
P = Probability

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

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

ANNEXURE C: CV

Tony Barbour
ENVIRONMENTAL CONSULTING AND RESEARCH

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(Tel) 27-21-761 2355 - (Fax) 27-21-761 2355 - (Cell) 082 600 8266
(E-Mail) tbarbour@telkomsa.net

Tony Barbour's experience as an environmental consultant includes working for ten years as a consultant in the private sector followed by four years at the University of Cape Town's Environmental Evaluation Unit. He has worked as an independent consultant since 2004, with a key focus on Social Impact Assessment. His other areas of interest include Strategic Environmental Assessment and review work.

EDUCATION

- BSc (Geology and Economics) Rhodes (1984);
- B Economics (Honours) Rhodes (1985);
- MSc (Environmental Science), University of Cape Town (1992)

EMPLOYMENT RECORD

- Independent Consultant: November 2004 – current;
- University of Cape Town: August 1996-October 2004**:** Environmental Evaluation Unit (EEU), University of Cape Town. Senior Environmental Consultant and Researcher;
- Private sector: 1991-August 2000: 1991-1996**:** Ninham Shand Consulting (Now Aurecon, Cape Town). Senior Environmental Scientist; 1996-August 2000: Steffen, Robertson and Kirsten (SRK Consulting) – Associate Director, Manager Environmental Section, SRK Cape Town.

LECTURING

- University of Cape Town: Resource Economics; SEA and EIA (1991-2004);
- University of Cape Town: Social Impact Assessment (2004-current);
- Cape Technikon: Resource Economics and Waste Management (1994-1998);
- Peninsula Technikon: Resource Economics and Waste Management (1996-1998).

RELEVANT EXPERIENCE AND EXPERTISE

Tony Barbour has undertaken in the region of 200 SIA's, including SIA's for infrastructure projects, dams, pipelines, and roads. All of the SIAs include interacting with and liaising with affected communities. In addition he is the author of the Guidelines for undertaking SIA's as part of the EIA process commissioned by the Western Cape Provincial Environmental Authorities in 2007. These guidelines have been used throughout South Africa.

Tony was also the project manager for a study commissioned in 2005 by the then South African Department of Water Affairs and Forestry for the development of a Social Assessment and Development Framework. The aim of the framework was to enable the Department of Water Affairs and Forestry to identify, assess and manage social impacts associated with large infrastructure projects, such as dams. The study also included the development of guidelines for Social Impact Assessment, Conflict Management, Relocation and Resettlement and Monitoring and Evaluation.

Countries with work experience include South Africa, Namibia, Angola, Botswana, Zambia, Lesotho, Swaziland, Ghana, Mozambique, Mauritius, Kenya, Ethiopia, Oman, South Sudan and Sudan.

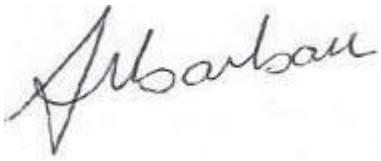
ANNEXURE D: DECLARATION

The specialist declaration of independence in terms of the Regulations_

I, Tony Barbour , declare that --

General declaration:

I act as the independent specialist in this application;
I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
I declare that there are no circumstances that may compromise my objectivity in performing such work;
I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
I will comply with the Act, Regulations and all other applicable legislation;
I have no, and will not engage in, conflicting interests in the undertaking of the activity;
I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
all the particulars furnished by me in this form are true and correct;
and
I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.



Signature of the specialist:

Tony Barbour Environmental Consulting and Research

Name of company (if applicable):

22 September 2017

Date:

ANNEXURE E

TERMS OF REFERENCE FOR ECONOMIC STUDIES

Economic Assessment: Construction and Operational Phase

The following effects are envisaged to be investigated in greater detail during the EIA phase:

During construction:

- Increase in production and GDP-R of the national and local economies due to capital expenditure
- Temporary employment creation in local communities and elsewhere in the country
- Household income will lead to the improved standard of living for households directly or indirectly benefitting from employment opportunities
- Effect on tourist repeat visitation
- Effect on property values due to the change in the landscape

During operation:

- Sustainable increase in production and GDP-R of the national and local economies due to operation expenditure
- Long-term employment creation in local communities and elsewhere in the country
- Household income will improve the standard of living for households directly or indirectly benefitting from employment opportunities
- Increase in government revenue stream due to payroll taxes and income taxes
- Effect on tourist repaeat visitation
- Effect in property values due to the change in the landscape

The **approach will include:**

Economic Modelling

In order to estimate the direct and follow-on effects of the proposed project expenditure, an economic modelling technique will be utilised. The modelling exercise makes use of an economic model developed on the basis of the Western Cape Province's SAM updated to 2018 figures. The SAM is a comprehensive, economy-wide database that contains information about the flow of resources that takes place between the different economic agents in this case in the provincial economy. A set of models will be developed to quantify the potential issues of the

proposed wind farm during construction and operation. The models will apply to the aspects detailed below.

Key economic considerations during construction:

- Increase in production and GDP-R of the national and local economies due to capital expenditure
- Temporary employment creation in local communities and elsewhere in the country
- Household income will lead to the improved standard of living for households directly or indirectly benefitting from employment opportunities

Key economic considerations during operation:

- Sustainable increase in production and GDP-R of the national and local economies due to operation expenditure
- Long-term employment creation in local communities and elsewhere in the country
- Household income will improve the standard of living for households directly or indirectly benefitting from employment opportunities
- Increase in government revenue stream due to payroll taxes and income taxes

Tourism Assessment

In the EIA phase a general trend analysis will be conducted looking at the accommodation numbers. If there was a visible change in trend after the construction of the West Coast One Wind Energy Facility it must be analyzed to determine whether the effect of the existing wind farm on such a trend change can be identified, dissociating it form any other potentially influencing factors (where survey is required, it will be undertaken). The existing West Coast One Wind Energy Facility will be used a case study.

It should be noted, however, that the tourism sector is subject to many forces and a single factor such as a wind farm would not be the only aspect, which could affect the tourism sector.

Property Values effect Methodology

To provide an overview of the possible effects on property values:

* Two case studies will be conducted on recently completed wind farms in the Western Cape and elsewhere in South Africa. The approach envisages to investigate the change in property prices before and after the completion of

the respective wind farms, utilising the Lightstone software. The Lightstone software enables access to property market data.

* The changes in property prices will then be compared to the average property price changes nationally and provincially to determine whether a wind farm affects surrounding property values compared to the average.
* In addition, real estate agents will be contacted and engaged with to debunk the property market status quo in the region.

It should be noted, however, that the property market is subject to many forces and a single factor such as a wind farm would not be the only aspect, which could affect property values.