Environmental Impact Assessment for the proposed Ubuntu Wind Energy Project near Jeffrey's Bay, Eastern Cape: Final Environmental Impact Assessment Report

Chapter 10: Socio-economic Impacts

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CHAPTER 10. IMPACT ON ECONOMICS

10.1 INTRODUCTION

10.1.1 Terms of Reference

This economic specialist study forms part of the assessment phase of the EIA process. Its brief is to:

- Describe the existing economic characteristics/context of the local area and broader region.
- Identify and assess potential economic impacts at local as well as wider scales as relevant. These are expected to include the following:
  - Broad level review of the need and financial viability/risks associated with the project.
  - Degree of fit with local, regional and national economic development visions and plans including renewable energy planning
  - Impacts on overall economic development potential in the area including impacts on commercial enterprises nearby the site (incl. agriculture, small businesses, tourism establishments and others).
  - Impacts associated with project expenditure on direct and indirect employment and household incomes. These impacts should be investigated through an examination of how the project and the spending injection associated with it may affect on the local, regional and national economy.
  - Impacts associated with environmental impacts that have economic implications. This should focus on positive impacts associated with renewable energy use as well as potential negative impacts on neighbouring land owners should they be relevant.
- Propose and implement additional ToR, if required, based on professional expertise, experience and compliance with the relevant specialist study guidelines and best practice.

10.1.2 Approach and information sources

The approach adopted in this study involved the following steps in line with accepted EIA practice:

1. Investigate the existing economic context within which the project would be established.
2. Identify economic impacts.
3. Evaluate economic impacts including those of a cumulative nature.
4. Recommend mitigation measures.

The approach to this study was taken from the Department of Environmental Affairs and Development Planning (Western Cape) guidelines on economic specialist input to EIA processes which are broadly based on a cost-benefit approach to assessment (van Zyl *et al*., 2005). They include guidance on the appropriate level of detail required for the assessment in order that it is adequate for informing decision-making without going into excessive or superfluous detail (i.e. superfluous detail in this report as well as superfluous detail when the briefs of other specialist

studies forming part of the EIA are taken into account). While these guidelines were developed as part of a Western Cape government initiative, they are equally applicable to other parts of South Africa and were endorsed at a national level by the then Department of Environment Affairs and Tourism. Impact significance ratings were generated using CSIR guidelines for impact rating (see Chapter 4 of this report for an outline of the assessment criteria). All ratings reflect a consideration of direct and cumulative impacts.

Information was gathered from the following sources in order to investigate the existing economic situation that potentially would be affected by the project:

- Information generated during consultations with the public and authorities;
- Census 2001 and Community Survey 2007 data from the Statistics South Africa database; and
- Local economic development and planning documents.

Details on the approaches used to assess impacts are contained in the individual sections dealing with the impacts.

10.1.3 Assumptions and limitations

- All technical, financial (i.e. market surveys, business plans and costs) and other information provided by the proponent and other official sources is assumed to be correct.
- The quantification of economic impacts in order to inform the assessment of the significance of impacts was not possible, nor considered necessary, for all impacts. Where possible, quantification focused on impacts considered to be most important in the overall assessment. Assessments of impact significance made without quantification (and based on a consideration of the likely magnitudes of impacts and/or expert judgements) are, however, considered adequate unless otherwise specified.
- The assessment only considers the impacts of the proposed project and the "no-go" option and does not make comparisons with other wind energy projects.
- The assessment borrows heavily from information gathered as part of the compilation of the economic specialist study forming part of the EIA of the Mainstream Jeffrey's Bay Wind Project (This is done only where relevant and in order to avoid unnecessary duplication of effort).
- The findings of the assessment reflect the best professional assessment of the author drawing on relevant and available information within the constraints of time and resources thought appropriate and made available for the assessment. See Appendix 10.1 for the disclaimer associated with this report.

10.1.4 Expertise and declaration of independence

The report was compiled by Dr. Hugo van Zyl who holds a Ph.D. in economics from the University of Cape Town. He has thirteen years experience focusing on the analysis of projects and policies with significant environmental and development implications and has been involved in project appraisals of infrastructure projects, industrial and mining developments, mixed use developments, conservation projects and eco-tourism initiatives throughout Southern Africa. He has led, participated in, and co-ordinated research in economic impact assessment, environmental resource economics and project appraisal and has contributed specialist input to

over 50 environmental assessments (EIAs and SEAs). Dr. van Zyl is also the lead author of the Western Cape Department of Environmental Affairs and Development Planning guidelines on economic specialist input into EIAs (van Zyl *et al*., 2005).

Dr. Hugo van Zyl is independent and has no vested or financial interests in the proposed development being either approved or rejected.

BOX 10.1: DECLARATION OF INDEPENDENCE FOR ECONOMIC ASSESSMENT

I **Hugo van Zyl** declare that I am an independent consultant and have no business, financial, personal or other interest in the proposed Wind Current Ubuntu Wind Energy Project, application or appeal in respect of which I was appointed, other than fair remuneration for work performed in connection with the activity, application or appeal. There are no circumstances that compromise the objectivity of my performing such work.

HUGO VAN ZYL

10.2 DESCRIPTION OF THE AFFECTED ECONOMIC ENVIRONMENT

The significance of impacts is often highly dependent on the economic environment or context within which they occur. For example, job creation in a small local community with a stagnating economy and high unemployment will be far more significant than it would be in a larger community with a healthy economy. In order to offer such baseline information to the impact assessment this section describes the economic environment. The main information sources used were Census 2001 data, Community Survey 2007 data, Integrated Development Plans and Demarcation Board data.

The site is between Jeffrey's Bay and Hankey and forms part of the Kouga Municipality, which, in turn, forms part of the Cacadu District Municipality in the Eastern Cape.

According to the Kouga IDP,

> *"The Regional settlement pattern in the study area is characterised by various nodes and urban areas that have different functions within the region. Humansdorp, with the highest population concentration in the region, has an established infrastructure and acts as a regional service centre, supplying the surrounding agricultural communities and the coastal towns with commodities and services. Commercial and industrial activities of the region are centred in Humansdorp. The coastal towns of Jeffrey's Bay (which is developing tremendously), St Francis Bay, Cape St Francis and Oyster Bay are important and well-established tourist destinations. The urban areas of Hankey and Patensie, situated in the Gamtoos River Valley, provide important services to the surrounding high-density agriculture industry. These two towns are characterised by agricultural related industries"* (Kouga Municipality, 2007).

10.2.1 Current land uses

The proposed Ubuntu Wind Energy Project is planned to be situated on a coastal plateau, approximately 120 m to 200 m above sea level, inland of the N2 national road. The facility will extend over two farms, Zuurbron and Vlakteplaas. Zuurbron extends from approximately 6 to 15 km from the coast; and Vlakteplaas extends from approximately 4 to 6 km from the coast, with the southern border of the latter farm being on the N2.

At present the proposed site is zoned for Agriculture and is mainly used for extensive cattle grazing. No other viable agricultural activities have been identified for the site aside from broiler chickens and potentially game farming. Given the rocky ground and shallow soils, the land is not particularly suitable for crop farming.

To the east of the site the Gamtoos River floodplain is under intensive irrigated cultivation. In the Hankey and Patensie area citrus cultivation is particularly prominent using irrigation water sourced from the nearby Kouga Dam. Settlements such as Hankey and Humansdorp have developed as service centres for the agricultural industry.

In terms of proximity to residential areas, the eastern-most point of the study area is approximately 5-6 km south from the closest inhabited residential area of Kabeljous River Mouth which is at the north eastern tip of Jeffrey's Bay (Chapter 1, Figure 1.1). These areas and other towns along the coast have a strong tourism component with strong seasonal variations in ***population. Jeffrey's Bay is the largest of the coastal towns and aside from tourism is diversifying*** into light and medium industry. Other towns with a strong tourism and retirement focus include Aston Bay, Paradise Beach and St Francis Bay to the south of Jeffrey's Bay.

There are various power line, road and railway networks covering the area as one would expect given its status as a regional hub. A 132 kV power line crosses the site in an east-west direction north of the N2 highway, with the Melkhoutbosch substation located on this power line north of the N2-R330 interchange. The electricity generated at the Ubuntu Wind Energy Project will feed into the 132 kV line and into the Melkhoutbosch substation (CSIR, 2011).

The N2 is a main freight and tourist route between Port Elizabeth and Cape Town. Other main roads are the R102 between Jeffrey's Bay and Humansdorp and the R330 between Hankey and St Francis Bay. A number of relatively large structures are visible in the wind farm area, such as communication towers and chicken broiler housing. Various quarries are also present in the area. In addition, there are viewpoints in protected areas which potentially will be affected by the wind farm including the Kabeljous River Nature Reserve and the Kabeljous River Natural Heritage Site. Tourism facilities are also present nearby the site particularly north of the N2 between the site and Jeffrey's Bay.

10.2.2 Demographics

The 2007 Community Survey estimated that the total population in Kouga has grown slightly since 2001 to 73 274 and decreased slightly in the Cacadu District to 363 485 (StatsSA, 2008). Estimates in the Kouga IDP argue for a substantially higher population estimate of up to 86 000 people fuelled by a population growth rate of 2.4% per annum between 2000 to 2010 (Kouga Municipality, 2007).

The revised Kouga IDP (KLM, 2010) points out that Jeffrey's Bay is now reputed to be one of the fastest growing towns in South Africa and the current trend suggests a high growth rate at 2.5% per annum for Jeffreys Bay and 2% for Humansdorp. It predicts that the population of the municipality will reach 90,000 within four years (see Table 10.1). Population growth predictions for smaller towns such as Hankey and Patensie are generally 1% or lower with only Cape St Francis and St Francis Bay exceeding this estimate with 1.5% annual growth.

Table 10.1: Population numbers in the wider study area (2010 and onwards)

SETTLEMENT	GROWTH RATE	NO. OF HOUSEHOLDS	CURRENT POPULATION	EFFECTIVE POPULATION GROWTH RATE				
				YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
CAPE ST. FRANCIS & ST. FRANCIS BAY	1.5%	3,031	2,800	2,842	2,885	2,928	2,972	3,016
HANKEY	1%	3,039	11,721	11,838	11,957	12,076	12,191	12,319
HUMANSDORP	2%	5,617	23,991	24,471	24 960	25,459	25,968	26,488
JEFFREYS BAY	2.5%	11,356	40,203	41,208	42,238	43,294	44,377	45,486
LOERIE	0.5%	573	2,428	2,440	2,452	2,465	2,477	2,489
OYSTER BAY	1.0%	533	1,016	1,026	1,036	1,047	1,057	1,068
PATENSIE	1.0%	928	3,845	3,883	3,922	3,962	4,001	4,041
THORNHILL	0.5%	660	2,250	2,257	2,264	2,270	2,277	2,284

Source: KLM (2010)

10.2.3 Employment

As with the rest of the country, unemployment is a major challenge in the area. The 2007 Community Survey indicates that unemployment in the Kouga Municipality has stayed at 27% for 2007 little changed from the 2001 estimate (StatsSA, 2008). For the individual towns in the municipal area, Table 10.2 shows that unemployment was highest in the smaller towns of Patensie (39.7%), Hankey (32.5%), Thornhill (32.5%) and Loerie (32.5%). Jeffrey's Bay and Humansdorp fared better at roughly 20% unemployment.

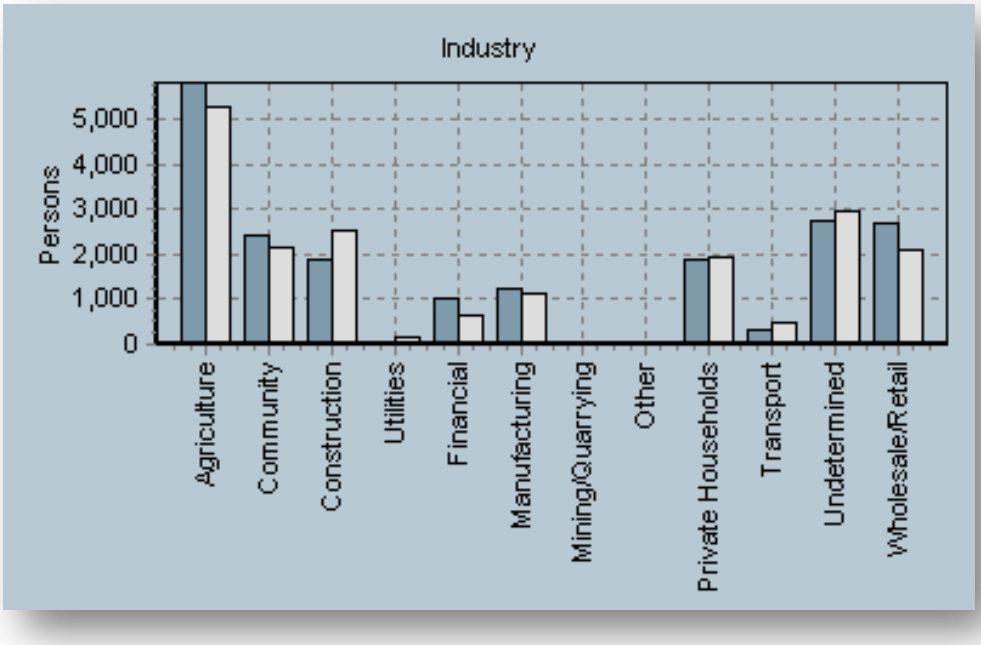
Table 10.2: Unemployment in the towns within the Kouga Municipality (2006)

SETTLEMENT TYPE	ELIGIBLE WORK FORCE (19 - 65 YRS)	PERMANENT RESIDENTS WITHOUT JOBS	%	SEASONAL FARM WORKERS	TEMPORARY DOMESTIC WORKERS	PERMANENT FARM WORKERS	PERMANENT INDUSTRY WORKERS	PROFESSIONAL WORKERS
CAPE ST. FRANCIS & ST. FRANCIS BAY	1523	305	20	N/A	Unknown	N/A	N/A	Unknown
HANKEY	6388	2078	325	430	860	2364	430	227
HUMANSDORP	13051	2662	20.4	82	862	2513	6315	615
JEFFREYS BAY	21870	4462	20.4	0	459	0	15230	1720
LOERIE	1320	429	32.5	Unknown	Unknown	Unknown	Unknown	Unknown
OYSTER BAY	553	114	20.6	N/A	43	N/A	352	44
PATENSIE	2092	830	39.7	221	83	258	1070	92
THORNHILL	1224	398	32.5	Unknown	Unknown	Unknown	Unknown	Unknown

Source: KLM (2010)

Figure 10.1 shows that the number of jobs in the Kouga Municipality increased by the greatest degree in the construction sector between 1996 and 2001 reflecting rapid development of the area. The agriculture, forestry and fisheries sector shed the greatest number of jobs during the same period in keeping with trends such as increased mechanisation. Notwithstanding this, for the Cacadu District Municipality and the Kouga Municipality, the dominant sector in terms of employment provision in 2001 was agriculture, forestry and fishing providing 36% and 33% of all employment opportunities in these areas respectively. Other important sectors in the Kouga

Municipality include wholesale and retail trade (15% of employment in 2001) and community/social/personal services (14% of employment in 2001). By comparison with the wider Kouga Municipality, Humansdorp and Jeffrey's Bay have particularly high proportions of workers in the wholesale and retail trade, services as well as construction sectors reflecting their status as service centres with high growth. In Patensie, Hankey, Thornhill, Loerie and KwaNomzamo, by contrast, far higher levels of employment are associated with the agriculture, forestry and fishing reflecting a high concentration of lower skilled jobs among its residents.



Source: Demarcation Board using Census 2001 & 1996

Figure 10.1: Jobs per sector for the Kouga Municipality (1996 – dark bars, 2001 – lighter bars)

Data from the ECSECC (Eastern Cape Socio-Economic Consultative Council) database provides a more recent detailed breakdown of employment per industry within the Kouga Municipality (see Table 10.3). It shows that the key proportional increases in employment relative to 2001 have come in business and personal services (6% of employment in 2001 up to 12% of employment in 2010) and the key proportional decreases have occurred in agriculture, forestry and fishing (33% of employment in 2001 down to 28% of employment in 2010).

Table 10.3: Employment per industry in the Kouga Municipality (2007 -2010)

	2007	2008	2009	2010	
Agriculture, forestry and fishing	11 479	9 463	7 457	9 856	28.3%
Mining and quarrying	23	28	32	27	0.1%
Food, beverages and tobacco	617	641	662	692	2.0%
Textiles, clothing and leather goods	197	183	173	210	0.6%
Wood, paper, publishing and printing	226	230	207	249	0.7%
Petroleum products, chemicals, rubber and plastic	145	155	154	160	0.5%
Other non-metal mineral products	303	292	239	294	0.8%
Metals, metal products, machinery and equipment	368	382	387	405	1.2%
Electrical machinery and apparatus	44	47	46	47	0.1%
Radio, TV, instruments, watches and clocks	20	20	21	21	0.1%
Transport equipment	269	284	271	307	0.9%
Furniture and other manufacturing	508	475	463	547	1.6%
Electricity	39	43	39	42	0.1%
Water	106	88	74	91	0.3%
Construction	4 359	3 587	2 961	4 121	11.9%
Wholesale and retail trade	4 421	4 079	3 700	4 682	13.5%
Catering and accommodation services	704	617	563	570	1.6%
Transport and storage	320	340	330	312	0.9%
Communication	62	61	60	50	0.1%
Finance and insurance	300	333	345	341	1.0%
Business services	3 368	3 880	3 954	3 854	11.1%
Community, social and personal services	4 396	4 468	4 423	4 909	14.1%
General government	2 699	2 791	2 867	2 984	8.6%
Total	**34 972**	**32 488**	**29 426**	**34 770**	**100.0%**

Source: Data from ECSECC database

10.2.4 Income levels and poverty measures

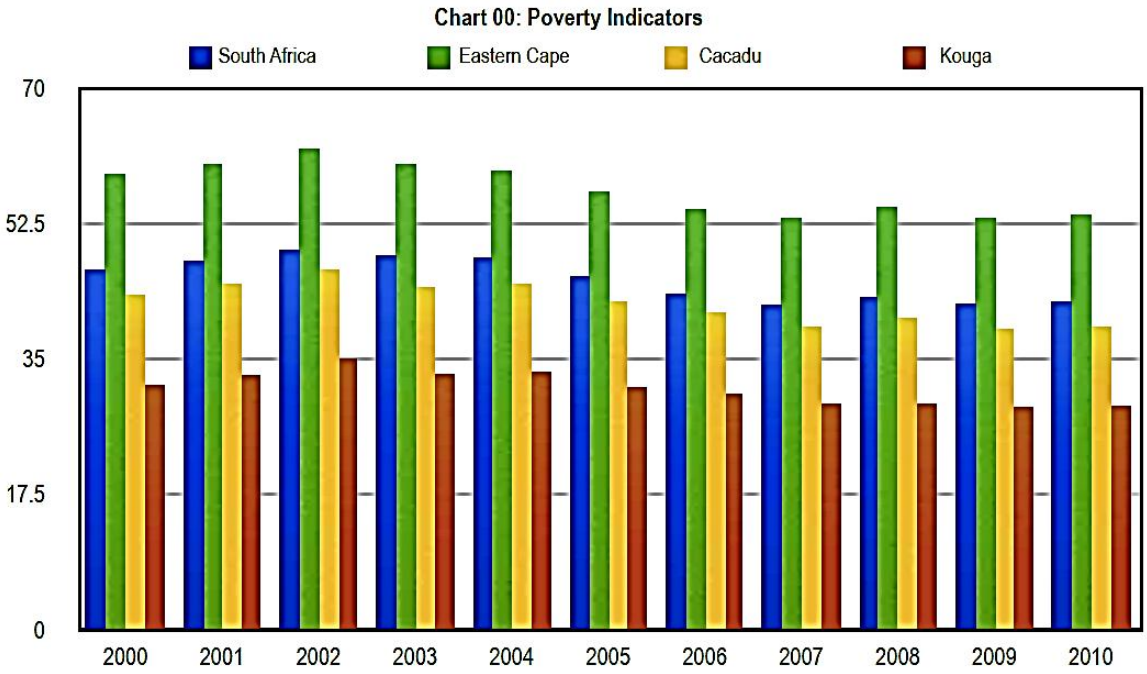
Household income levels in the study area are presented in Table 10.4. Approximately 44% of households in the Cacadu District Municipality and 33% in the Kouga Municipality had incomes below R 9,600 per year in 2001. KwaNomzamo had a similar income pattern to the District (46% of households with incomes below R9,600 per year) while Jeffrey's Bay and Humansdorp fared substantially better than the District and slightly better than the wider Kouga Municipality.

Table 10.4: Household incomes in the wider study area (2001)

	Cacadu District	Kouga Municipality	Humansdorp	Jeffreys Bay	KwaNomzamo
No income	14%	11%	9%	10%	17%
R1 - R4 800	7%	5%	3%	3%	8%
R4 801 - R9 600	23%	17%	13%	13%	21%
R9 601 - R19 200	23%	24%	20%	17%	29%
R19 201 - R38 400	15%	19%	26%	17%	18%
R38 401 - R76 800	8%	12%	15%	18%	5%
R76 801 - R153 600	5%	8%	9%	14%	1%
R153 601 - R307 200	2%	3%	4%	6%	0%
R307 201 - R614 400	1%	1%	1%	1%	0%
R614 401 - R1 228 800	0%	0%	0%	1%	0%
R1 228 801 - R2 457 600	0%	0%	0%	0%	0%
R2 457 601 and more	0%	0%	0%	0%	0%
Total	100%	100%	100%	100%	100%

Source: StatsSA, 2002

The 2007 Kouga IDP notes that the proportion of households living in poverty has increased by 6.4% in the past 10 years from 26.6% to 32.9%. The rate of increase in the Eastern Cape Province and Cacadu District ranges between 9% and 10% over the same period. Encouragingly the Human Development Index (HDI) for the Kouga area has improved in the past 10 years from 0.57 in 1996 to 0.62 in 2005 and remains better than the provincial and District HDI (KLM, 2007). The 2010 IDP review also notes the lower rates of poverty in the Kouga Municipality than nationally, provincially or on a district level (see Figure 10.2). It further illustrates that since 2003 there has been a steady decline in poverty in the Kouga Municipality (KLM, 2010).



Source: KLM (2010)

Figure 10.2: Poverty levels in the Kouga Municipality over time

10.2.5 Economic growth and development

Economic development faces many challenges in the Kouga Municipality although its performance relative to other areas in the Cacadu District Municipality and Eastern Cape is encouraging. The Kouga IDP points out that municipal productivity is higher than the averages for the Cacadu District and Eastern Cape Province principally due to high growth in value creation relative to employment and labour remuneration. Growth in Gross Domestic Product (GDP) and employment, from 1996 to 2004, and skills available to the local economy, are both higher than the Provincial average. The Kouga Municipality also has among the highest Formal Economy Performance scores in the province, with positive factors including the positive trade balance, a fairly diversified economy, low financial grant dependence, and strong GDP and employment growth performance. The Municipality fares well on Economic Absorption Capacity, considering high total disposable income, employment multiplier and informal sector capacity to generate economic opportunities relative to formal employment. The local economy claims a comparative advantage, for both employment and GDP contribution, in agriculture (centred on agriculture and hunting at 9.87% of GVA and 27.99% of employment) and construction (6.18% of GVA and 10.42% of employment). Kouga also claims GVA advantages in utilities (electricity supply and water), trade (centred on retail trade) and community services (dominated by public administration) (KLM, 2007).

With regard to tourism, the Kouga Municipality is home to a string of popular coastal tourist destinations from Jeffrey's Bay to Cape St Francis, and offers a wide range of activities and products including historical and heritage sites, the Kouga Cultural Centre, surfing, fishing, hiking, biking and sandboarding, birding and game viewing, and various other outdoor and

adventure activities (Kouga Municipality, 2007). Tourism in the region is predominantly linked to the natural environment and has shown strong growth.

10.3 IDENTIFICATION OF ISSUES

Aside from fit with planning and financial viability (and associated risks), the following impacts were identified as relevant for assessment based on the guidelines for economic specialist input (van Zyl *et al*., 2005), information from consultations with the public and nature of the project and receiving environment:

1. Impacts on land owners within the site boundaries;
2. Impact on surrounding land uses;
3. Impacts on tourism; and
4. Impacts on commercial activity associated with expenditure linked to the construction and operation of the development.

These impacts were rated using accepted EIA conventions for determining their significance. Significance ratings were not appropriate or necessary for planning fit and financial viability. A discussion regarding cumulative impacts is also provided.

The key environmental impacts that could result in economic costs (externalities) are assessed in the sections dealing with impacts on tourism, impacts on land owners on the site, and impacts on surrounding land owners.

The economic implications of the loss of conservation-worthy habitat are not expected to be significant. Further consideration of the strategic conservation importance of the site and impacts on its ecology has been covered in the ecological specialist study (Pote and Marshall, 2011). This study found that impacts on ecological functioning and value would be low with mitigation. This mitigation would need to include avoiding ecologically sensitive areas, limiting the footprint of the wind turbines and other facilities, relocating plants where necessary, etc. The specialist studies dealing with impacts on birds and bats also found that successful mitigation should be possible and that monitoring in the early stages of the project would help to clear up any uncertainties with regard to impacts and assist with mitigation (see Chapters 6 and 7 of this report respectively).

10.4 ASSESSMENT OF IMPACTS AND IDENTIFICATION OF MANAGEMENT ACTIONS

This section provides an assessment of the impacts identified above and suggests management actions to avoid or reduce negative impacts; or to enhance positive benefits.

10.4.1 Need and Fit with policy and planning

The Ubuntu Wind Energy Project's key strategic objectives can be summarised as providing additional generation capacity and grid stability in the Kouga area whilst meeting national renewable energy and climate change targets. This section assesses the likely impact of the project on achieving these objectives along with a wider consideration of the project's fit or compatibility with economic development planning objectives.

10.4.1.1 Energy policy imperatives and the environment

Historically, South Africa has relied heavily on non-renewable fossils fuels (primarily coal) for energy generation purposes. This reliance remains a key feature of the current energy mix with just over 90% of the electricity generation need met by non-renewables. Given the abundance of coal reserves relative to most other countries, it is not particularly surprising that the energy mix favours coal and it is to be expected that coal will remain dominant. However, relatively recent imperatives with regard to global warming, other environmental impacts associated with 'dirty' fuels and energy security have elevated renewable energy solutions to a far more prominent position both within energy policy and in the economic development arena in general. This has happened at a rapid pace particularly in response to the threats associated with global warming. Most governments in the global community now recognise that the roll-out of renewable energy at an unprecedented scale will be needed among a number of other actions to curb global warming. Targets for the promotion of renewable energy now exist in more than 58 countries, of which 13 are developing countries. In addition, the renewable energy industry is now a major economic player, with the industry employing over 2.5 million people worldwide. Renewable energy companies have grown significantly in size in recent years, with the market capitalisation of publicly traded renewables companies doubling from $50 billion to $100 billion in just two years from 2005 to 2007 (NERSA, 2009).

There may still be disagreement on the equitable sharing of responsibilities for curbing global warming among nations. However, proposals tabled at the 2009 UN Climate Change conference in Copenhagen by a group consisting of the United States, China, Brazil, South Africa and India indicate that key developing nations including South Africa recognise that they will not be able to avoid significant responsibilities. When one looks at the developing nations as a wider group, South Africa stands out as a country that is going to have to introduce particularly significant measures as it is characterised by high levels of Greenhouse Gas (GHG) emissions relatively to other countries at similar stages of development. Du Plooy (2009) points out the following in this regard:

- South Africa's carbon dioxide ($CO^{2)}$ production doubled between 1980 and 2004 and is higher than that of Brazil, which has more than four times the population, and only slightly lower than the UK.
- South Africa's economy is 5-10 times less carbon efficient (or its carbon intensity is 5-10 times higher) than the US, UK or Japan. Regarding total emissions, South Africa is not nearly as significant a contributor to climate change as China. However, South Africa is a far greater contributor to the world's CO^2 emissions than to the world's GDP and on this score just about exactly equalled China in 2003 at 2.8 tonnes of CO^2 for every $1000 of GDP generated, compared with the US at 0.55.
- South African emissions per capita are still half that of the US and slightly lower than Russia's, but three times higher than China's and nine times higher than India's.

South African energy policy has started to change from one that did very little to encourage renewable energy to one that actively encourages it. The Government's 2003 White Paper on Renewable Energy has set a target of 4% of electricity demand (equivalent to 10,000 Giga-watt hours (GWh)) from renewable energy sources in 2013 (DME, 2003).[1] This target has been further refined to differentiate between various renewables. On 3 August 2011, the Department of Energy (DoE) released the qualification and proposal documentation for South Africa's first renewable energy independent power producer (IPP) tender process, and announced that it has

[1] To put this into context, Europe as a whole has a renewable energy target of 20% by 2020.

allocated a total of 3 725 MW capacity across various renewables technologies, with 1 850 MW set aside for onshore wind, 200 MW for concentrated solar thermal, a further 1 450 MW for solar photovoltaic solutions, 12.5 MW for both biomass and biogas, 25 MW for landfill gas capacity, 75 MW for small hydro, and a further 100 MW for small-scale IPP projects of less than 5 MW. This allocation to wind energy is an increase on the 1 025 MW set out for the first procurement round in the Integrated Resource Plan (IRP) 2010-2030 (Source: Engineering News, 4 & 5 August 2011).
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Within the renewable energy sector in South Africa, wind energy shows substantial promise despite there being very few commercial wind turbines in the country at present. By comparison, for example, Germany currently has 22,000 wind turbines installed that produce the equivalent power of half of all South Africa's fossil fuel and nuclear power stations (van der Merwe, 2009).

According to Marquad *et al.* (2008) who researched the cost of achieving a 2020 target of 15% renewable electricity generation for South Africa, "Wind power is one of the most mature new renewable technologies, is currently in widespread use throughout the world, and is still growing very rapidly, particularly in developing countries such as China and India: Within a very short time, the Chinese wind programme has accelerated to a point where almost 3,500MW of new wind power is being installed each year (with estimates of 50,000MW installed by 2015), and 40 local companies are involved in manufacturing 56% of the equipment (Global Wind Energy Council 2007). An additional 20,000MW was installed globally in 2007, almost one fifth of totally global installed capacity of close to 100,000MW. There is also a trend towards larger-scale installations – currently, wind farms of over 1,000MW are being planned in a number of locations."

In summary, the policy case for the urgent roll-out of renewable energy in South Africa has been made at a national government level using compelling arguments that are in line with international policy trends. Targets that include wind energy have been set (which may be revised upwards) and significant financial and other incentives have been offered to renewable energy developers in order to encourage projects and move decisively towards full-cost pricing of energy (i.e. prices which reflect global warming and other environmental impacts).

10.4.1.2 Energy security

As is noted in the Scoping Report for this project (CSIR, 2010), "The Eastern Cape does not generate bulk power and is thus reliant on electricity imports from other provinces (e.g. Mpumalanga). The existing transmission capacity to the province is fully utilised, which restricts the province from realising its industrial and rural development potential. Due to the length of the Eskom power lines from the power stations to the Kouga area and the inherent characteristics of the Kouga network, the area experiences power quality and voltage instability. The project could thus assist in stabilising energy supply to the Eastern Cape and in particular the Kouga Municipality" (CSIR, 2011).

Aside from impacts on the achievement of national goals and policy imperatives outlined in the preceding section, the project therefore has the potential to contribute to:

- Greater energy supply stability in the area
- Higher levels of energy security in the area

This will benefit local residential electricity consumers as well as farmers and businesses in the area. In simplified terms the project could produce enough electricity to power approximately

175,000[2] typical Eastern Cape households in a year when at full generation capacity (CSIR, 2011).

10.4.1.3 Fit with local development and spatial planning

Economic development imperatives inform spatial planning imperatives. A critical aspect of economic desirability is thus whether the proposed development complements economic planning as reflected in spatial development planning. Note that the importance of the role played by local municipalities throughout South Africa in fostering sustainable economic development has increased since 1994 and will continue to increase in the future in keeping with a clear shift towards more 'developmental' local government. Tools such as Integrated Development Plans (IDPs) and their accompanying Spatial Development Frameworks (SDFs) are likely to play a prominent role in facilitating this shift. SDFs in particular are central to economic development planning and are drawn up in order to guide overall development in a direction that local and provincial authorities see as desirable. Indeed, the basic purpose of an SDF is to specify the spatial implications of IDPs designed to optimise economic opportunities.[3] Specifically, a SDF has the following objectives and characteristics (Dennis Moss Partnership, 2003):

- It expresses government policy and the views and aspirations of all I&APs.
- Government departments and other authorities and institutions involved in future development and land use planning in the municipality will be bound by the SDF proposals.
- It provides certainty to the affected communities regarding future socio-economic and spatial development in the area.
- It provides a basis for co-ordinated decision-making and policy formulation related to future land use.
- It creates opportunities for preparing development and action plans to which financial budgets can be linked.

The proposed development thus ideally needs to 'fit' with what is envisaged in SDFs, structure plans and other planning documents in order for it to clearly 'fit' with the optimal distributions of economic activity as envisaged in these plans. Or, if it doesn't obviously fit with existing planning, there need to be clear and compelling reasons why a deviation from planning should be considered.

The following provincial and regional planning documents were found to be of relevance and are reviewed in more detail in the study:

- Eastern Cape Provincial Spatial Development Framework (2005);
- Western Cape Provincial Urban Edge Guidelines (2005);
- Kouga Municipality IDP and SDF (2007 & 2011).

Considered as a whole these documents recognise the importance of integrated and diversified economic development that makes optimal use of each area's comparative advantages. The

[2] Where a typical Eastern Cape household uses 1,500 KWh per annum. In South Africa, usage ranges from less than a 1,000 KWh per year to over 8,000 KWh per year.

[3] Note that studies such as the growth potential of towns in the Western Cape study (van der Merwe *et al*., 2005) also inform IDPs and economic planning.

concept of a wind farm is thus broadly supported and the levels of support for wind projects in the area and other parts of South Africa indicates that interest in their potential to add to economic development is recognised.

With regard to specific spatial planning that applies to the site, the Kouga SDF is most relevant. A review of the SDF reveals that the site is situated significantly outside the reasonably anticipated short, medium and long term Urban Edge of the nearest urban areas of Jeffrey's Bay implying no potential conflict in this regard. Furthermore, it is on the northern side of the N2 which is likely to remain a significant barrier to further expansion of Jeffrey's Bay in the direction of the wind project site in the longer term.

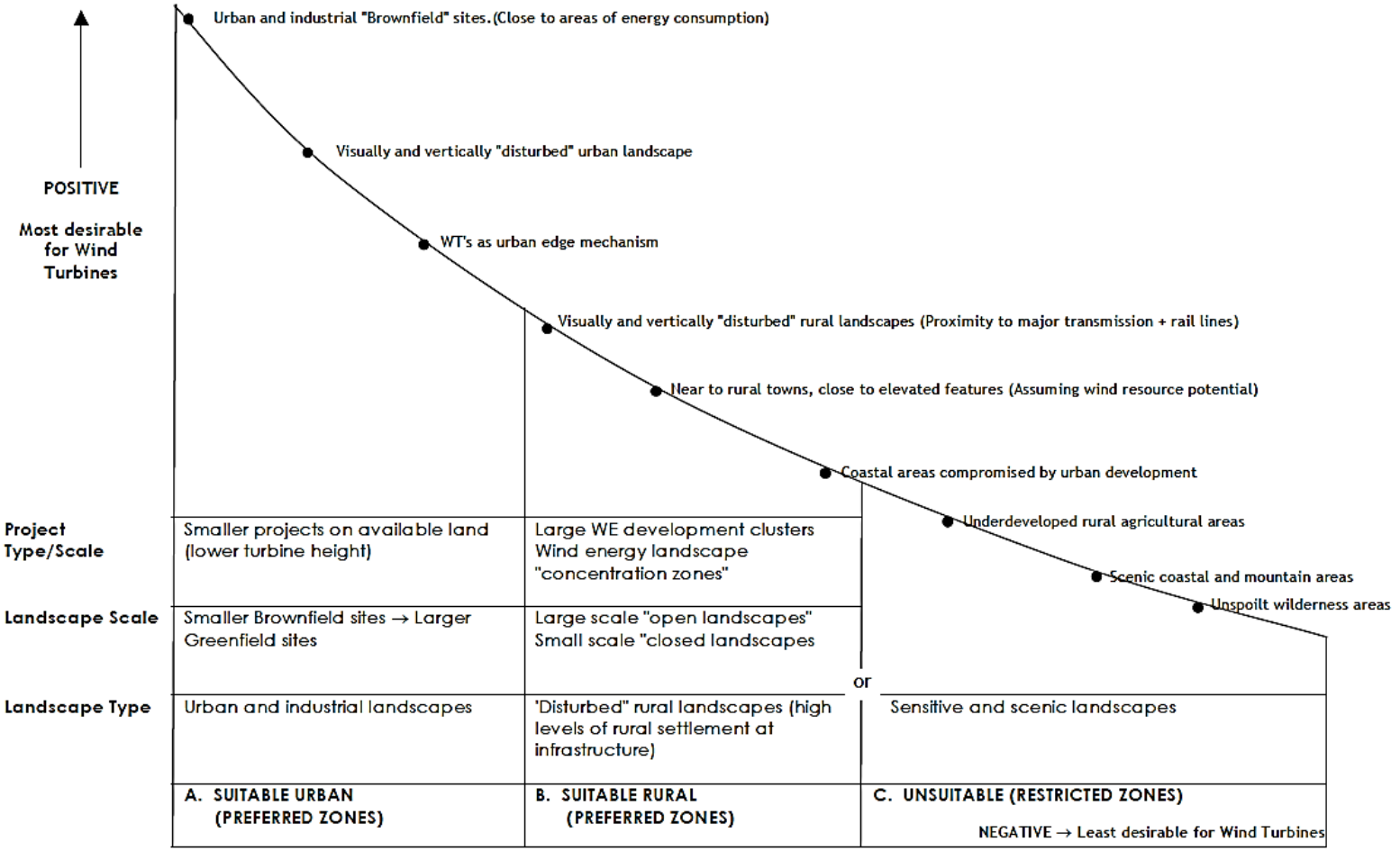
10.4.1.4 Wind energy development guidance

The 2006 DEA&DP Strategic Initiative to Introduce Commercial Land Based Wind Energy Development to the Western Cape resulted in the publication of broad guidelines for the siting of wind farms in order minimize their potential to impact negatively on other land uses and sources of economic value (see CNdV, 2006). A key focus of the guidelines is on minimizing visual impacts on key receptors. The guidelines combine relevant elements of two assessment methodologies (i.e. criteria based assessment and landscape based assessment) in order to produce a consolidated 'Revised Regional Methodology' which provides the primary guidance regarding siting. Figure 10.3 provides a summary of how the landscape criteria in this methodology are to be used to conclude whether a site is likely to be suitable for wind energy developments or not. When applying this methodology to the proposed Ubuntu site, the following factors indicate that it should probably be most accurately classified as 'suitable rural':

- The close proximity of coastal areas with relatively high levels of development.[4]
- Its location relatively close to Jeffrey's Bay and Humansdorp and therefore energy consumers.
- The presence of infrastructure and other elements in the area such as major roads, powerlines, a broiler chicken housing and quarries.

It should, however, be borne in mind that site specific assessments are needed in order to establish suitability particularly from a visual perspective. These are provided in the visual specialist study (see visual study in Chapter 8 of this report).

[4] The visual specialist study notes that "The wind farm will be located within a mixed landscape containing agricultural and coastal resort elements. Agricultural landscapes have a low sensitivity to changes brought by wind farms, and the coastal resort landscapes in Kouga are rapidly changing as towns expand and merge." (see visual study in Chapter 8 of this report).



Source: CNdV Africa (2006)

Figure 10.3 Framework for Location of Wind Energy Projects Based on Landscape Character

A Strategic Environmental Framework (SEF) for the Optimal Placement of Wind Farms in the Coastal Provinces of South Africa (Environomics, 2011) has also recently been produced for the National Department of Environmental Affairs (DEA). This document is intended as a national decision-making level framework to guide national decision-makers and especially the DEA. It recognises and draws on provincial or regional guidelines such as that referred to above and supports the use of relatively strict criteria in the wind farm approval process in order to avoid unnecessary risks including those related to tourism. One of its key points is that there are a large number of applications for wind farms which gives decision makers the 'luxury' of being in a position to pick only the ones with the greatest promise and minimal risks. This dynamic concerning decisions between wind farms and it implications are discussed further in Section 5.2.

10.4.2 Financial viability and risks

Long term positive economic impacts can only flow from a project that is financially sustainable (i.e. financially viable in the long term with enough income to cover costs). As with all other wind power and other renewables projects, the proposed project would not be financially viable without the gradual phasing out of implicit subsidies for non-renewables and coal in particular. This phasing out also needs to be combined with the phasing in of subsidies for renewable in order to 'level the playing field' as outlined in Section 10.4.1.1. In combination, the tax on non-renewables, the accelerated depreciation allowance and REFIT or other financial support outlined previously have catalysed high levels of interest in establishing renewable energy projects such as the Ubuntu Wind Project. These measures should essentially ensure the financial viability of appropriate renewables projects in order to encourage these types of projects. The Ubuntu Wind Project is thus highly likely to prove financially viable assuming it is able to secure a long term contract based on a reasonable tariff - this has been confirmed with the proponent (D. Wolfromm, WKN-Windcurrent SA, pers com).

As mentioned previously, in a competitive bidding process, the relevant authorities will only be offering a limited number of private wind power producers long term power purchase contracts. It is therefore likely that the project will have to compete with other private wind projects for long term contracts. This competition may prove intense. Groenewald (2010) speculates that "All the wind power projects under way (in application phase) at present might ultimately deliver 5000 MW of power to Eskom's grid. This means that some start-up wind projects might not get in on the deal." At this stage it is not possible to determine whether the Ubuntu Wind Energy Project will be one of the projects chosen to qualify for a long term contract - the adjudication process will determine this. There are, however, a number of factors in the project's favour that include:

- Strong international and local partnerships;
- Extensive experience and reputation of WKN AG and Windcurrent SA;
- Advanced stage of viability assessment and environmental application process; and
- Potential to stabilise the local grid.

It needs to be recognised that profitable wind farms are only currently possible with a government subsidy and that a number of wind farm projects are competing for this subsidy. The use of public funds in the form of the subsidy calls for high levels of care in the allocation of funds. Fortunately, the existence of a number of alternative wind farm developers and sites looking to access the subsidy means that the state can be selective in allocating the subsidy to those projects (and project alternatives) that show the most promise and lowest levels of risks of negative impacts. Indications are that a particularly large number of alternative wind energy projects will be available for the state to choose from. Private developers recently submitted expressions of interest to The Department of Energy for the development of various renewable energy projects with a combined capacity of 20,000 MW, the bulk of which would be wind power

generation (Salgado, 2010). This exceeds the 3725 MW earmarked for the allocation of the first round of the REFIT by a highly significant margin (Source: Engineering News, 4 & 5 August 2011). Alternatives are therefore not likely to be in short supply even if one assumes that a large proportion of expressions of interest related to projects that have yet to reach the EIA stage and that many may not even get this far.

While risks cannot be ignored, financial viability risks are considered minor assuming a long term contract can be agreed on with the relevant authorities that secures payment for the electricity generated. The project will, however, have to compete with other wind energy projects in order to secure a contract.

The balance between financial benefits and costs are thus likely to be positive for the applicant and land owners partners. These financial returns that motivate developments such as the Ubuntu Wind Energy Project are necessary as the promise of profit is what fuels much of our economy. It does, however, need to be recognized that achieving profits for some can come at an unacceptable cost to wider society. The remainder of this report focuses on the economic impacts (including costs and benefits) that would accrue to wider society in order to provide information on the overall economic desirability of the project.

10.4.3 Impacts on land owners within the site boundaries

The installation of wind turbines and associated infrastructure has the potential to impact both positively and negatively on the land owners whose land parcels will be included in the project. Positive impacts would flow primarily from sharing in the profits of the projects while negative impacts could be associated with the loss of land, disruption of activities and the introduction of nuisance factors (primarily noise and visual impacts).

10.4.3.1 Positive impacts

As in the case of wind farms in other parts of the world, the project would entail payments to the private land owners on whose land turbines and related infrastructure would be placed. These would take the form of either fixed rental payment per turbine or variable payments based on a share of profits. Each land owner would be required to decide between these options and whether the final payment offer is acceptable. As no-one would be forced to accept an offer, each land owner would be able to weigh up the financial gains from the project against any negatives. This should result in net financial gains to land owners and minimise the chances of land owners ending up financially worse off because of the project.

10.4.3.2 Negative impacts

At present the proposed site is zoned for Agriculture, and is mainly used for extensive cattle grazing, with a relatively low carrying capacity of roughly 1 Large Stock Unit (LSU) / 3.5 hectares and higher with feed augmentations. Given the rocky ground and shallow soils, the land is not suitable for crop farming (CSIR, 2010). Table 10.5 below summarises the key farming activities on each farm making up the study site.

Table 10.5: Activities on the farms making up the site

Landowner	Farm name and size of land included in wind farm proposal	Activities
Jaques Steenkamp	Zuurbron – 3,550 ha in total, of which 2,050 ha where turbines are planned	– Farming with roughly 600 beef cattle on permanent grasses. – Staff of 12 workers on all land including those parcels with no turbines planned (i.e. 3,550 ha). – Soil potential generally low. Carrying capacity is roughly 1 LSU / 3.5 ha.
Frank Lotter	Vlakteplaas – 800 ha	– Farming with roughly 400 beef cattle on permanent grasses. – Staff of 3 workers on farm. – Soil potential generally low. Potential being augmented with chicken litter from neighbouring farm which allows for higher carrying capacity of roughly 1 LSU / 2 ha.

Potential impacts on these activities could stem from loss of land, changed access, noise and other nuisance factors.

With regard to loss of agricultural land, the following estimates can be made for each component of the project:

- Mast footprints – roughly 400 m^2 (20m X 20m) for each turbine and 1.6 ha for 40 turbines
- Hard standing area – roughly 2000 m^2 (50m x 40m) for each turbine and 8 ha for 40 turbines
- Operations and maintenance building – 5,000 m^2
- Gravel roads – roughly 10 to 15 km (5 m width) of new roads covering a total of 5 to 7.5 ha

The likely total land needed for 40 turbines would be between 14.6 ha and 17.1 ha. Based on the natural carrying capacity of the area, the loss of this land would result in reduced capacity of 4 to 5 cattle in total. This would represent a minimal loss in production. It should also be considered a worst case scenario as both land owners have indicated that they have spare capacity to move cattle and should in a position to expand production elsewhere on their land using income from the wind project (J. Steenkamp & F. Lotter, *pers com*.)

With respect to potential negative impacts from noise, the noise specialist study has found that if adequate mitigation measures are implemented negative impacts associated with noise would be acceptably low for inhabited buildings (Williams, 2011).

With respect to visual impacts, there can be no doubt that the visual landscape on the farms will change significantly. It is not, however, anticipated that these changes will lead to unmanageable conflicts of agricultural activities on the farms making up the site. Also it should be borne in mind that the farmers will be compensated for the presence of the turbines on their land and have indicated their willingness to accommodate the turbines on this basis.

Note that the construction phase of roughly one year would be associated with disruptions. However, these are expected to be minimal and manageable in consultation with land owners. Once established, all farming activities would essentially be able to continue largely as before resulting in minimal, if any, impacts on these activities.

10.4.3.3 The balance between positive and negative impacts

Given the above, it is highly likely that the net impacts on all land owners would be positive and probably significantly so. All the land owners consulted confirmed that they were positive about the project and see it as a welcome source of additional income with relatively minimal risks and potential negative impacts provided there is adequate mitigation. Given the added income stream that would be associated with the wind farm, it is also likely that the value of properties on the site would increase. This would conform with experience in other countries.

Impacts have consequently been given a medium significance positive rating with mitigation (see summary impact rating table at the end of Section 5).

Mitigation measures

- Recommendations of noise, visual, ecological, bird and bat specialist studies to be implemented.
- Adequate setbacks from buildings, structures and residences in particular to be strictly enforced.

10.4.4 Impacts on surrounding land owners

Aside from onsite impacts, the installation of wind turbines and associated infrastructure has the potential to affect surrounding land owners. Negative impacts could be associated primarily with noise and visual impacts.

The site is surrounded mainly by other farms. No negative impacts are anticipated on the agricultural activities on these farms for the same reasons that no significant impacts are anticipated on agricultural activities on the site. All agricultural production and activities will be able to continue as at present.

The turbines would also be adequately set back from the closest residences and exceed the minimum requirements in this regard. The nearest turbine to any neighbouring residence would be approximately 1 km away from the residence on Kransplaas along the Kabeljous River. The nearest turbine to the residence on Farm 865 would also be adequately set back roughly 1.5 km from the residence.

With respect to noise, the noise specialist study found no instances where turbines would result in unacceptable impacts on neighbouring farms (Williams, 2011). In addition, WKN-Windcurrent SA intends applying international standards with respect to turbine placement distances from farm boundaries.

As a consequence of the prediction of minimal, if any, significant negative impacts, it is unlikely that there would be negative impacts on the agricultural value of properties surrounding the site.

Impacts consequently have been given a low negative to neutral rating with mitigation during operations although impacts may be slightly negative during construction given the potential for disruptions (see summary impact rating table at the end of Section 5).

Mitigation measures

- Recommendations of noise, visual, ecological, bird and bat specialist studies to be implemented.
- Adequate setbacks from site borders and residences in particular to be strictly enforced.

10.4.5 Impacts on tourism potential and development

As was outlined in the economic context section, tourism plays an important role in the economy of the local area and region and has the potential to play an increasingly prominent role as a driver of economic development. It is thus important to consider the potential impacts of the proposed development on this sector. Tourism impacts are often driven by changes in the sense of place in an area. The proposed development thus has the potential to impact on tourism as its nature dictates that it is likely to change the character of the area. Potential positive impacts could also arise should the development provide an added attraction in the area that could draw tourists.

In order to assess tourism impacts, information on current tourism use and potential future use focusing on the area surrounding the site was gathered. In order to verify and augment tourism issues raised during scoping, discussions were also held with tourism authorities and tourism stakeholders in order to get their views on potential impacts and inform assessment. Pertinent information from other specialist studies was examined, discussions were held with the specialists where necessary and an assessment of impacts made. In this regard the visual specialist study was most relevant.

Current tourism 'use' of the site is not direct in nature as there are no tourism facilities on the site. However, the site is indirectly part of the tourism package of the area as it can be seen from a number of vantage points, from routes used by tourists (i.e. the N2, R330 and R102) and from tourism establishments such as those offering accommodation.

10.4.5.1 Negative impacts

The potential for wind farms to have negative impacts on tourism is something that has received more research attention in Europe and the United States given the far greater number of wind farms in these countries. A recent review of research on the economic impact of wind farms on tourism covering 40 studies in the UK and Ireland and other reports from Denmark, Norway, the US, Australia, Sweden and Germany provides a comprehensive source of information on this issue (GCU, 2008). In summary it found that:

- "There is often strong hostility to developments at the planning stage on the grounds of the scenic impact and the perceived knock on effect on tourism. However developments in the most sensitive locations do not appear to have been given approval so that where negative impacts on tourism might have been a real outcome there is, in practice, little evidence of a negative effect.
- There is a loss of value to a significant number of individuals but there are also some who believe that wind turbines enhance the scene.

- An established wind farm can be a tourist attraction in the same way as a hydro-electric power station. This of course is only true whilst a visit remains a novel occurrence.
- In Denmark, a majority of tourists regard wind turbines as a positive feature of the landscape.
- Over time hostility to wind farms lessens and they become an accepted even valued part of the scenery. Those closest seem to like them most.
- Overall there is no evidence to suggest a serious negative economic impact of wind farms on tourists."

These findings indicate that clear instances of negative impacts on tourism are relatively rare. This does not imply that negative impacts cannot occur, but does point to the need to have high levels of certainty before concluding that a wind farm will have a significant negative impact on tourism. The available evidence in the GCU review suggests that instances where wind farms are most likely to result in negative impacts are those where they are situated in areas with a clear wilderness quality with little or no signs of 'civilisation' in the form of infrastructure such as power lines, major roads, etc. In addition concerns regarding tourism have been a key motivator of guidelines on wind farm location such as those produced for the Western Cape Department of Environmental Affairs and Tourism (CNdV, 2006) and, more recently, for the national Department of Environmental Affairs (Environomics, 2010). Concerns around tourism should not therefore be downplayed and risks should be kept to a minimum.

The visual specialist study has found that the proposed wind farm will be located within a mixed landscape containing agricultural and coastal resort elements. Agricultural landscapes have a low sensitivity to changes brought by wind farms, and the coastal resort landscapes in Kouga are rapidly changing as towns expand and merge (see visual study in Chapter 8 of this report).
The significance of the impact on the landscape character of the region has thus been assessed as moderate by the visual specialist. Potential for negative impacts have been noted as the facility would be visible over a large region. Viewers who will be most affected by the wind farm are those living on farms surrounding the development site. However, it is also noted that "there are not many sensitive viewers in these areas who will be highly exposed to the wind farm. Views from Jeffrey's Bay are unlikely to be highly impacted since scenic views are normally directed at the mountains in the north or the ocean. Protected areas in the region are generally too far from the site to be highly impacted (see visual study in Chapter 8 of this report)." The Kabeljous River Natural Heritage Site would be adjacent to the site. However, due to the topography of the area only parts of a few turbines will be visible from here and do not seem to be a cause for particular concern based on the visual assessment.

With respect to routes that tourists use in the area, the visual specialist study has found that the facility would be highly visible when viewed from routes used by tourists. However, it would have a relatively significant set-back distance from the N2 (roughly 3 km), the R330 (roughly 3.2 km) and the R102 (3.3 km). This would mitigate the visual impacts particularly when viewed from the N2 and R102. Also it should be noted that this area is already in a partially disturbed state. The views along the R330 are generally of a more undisturbed and rural nature with fewer signs of human habitation and infrastructure. Impacts on these views were a key concern for the tourism authorities in the area.

Key tourism establishments near the site are located along the gravel road to the south of the site that branches off the R102, crosses under the N2 and runs in a north-easterly direction roughly parallel to the Kabeljous River. They include Cob Creek restaurant and vineyards roughly 1.8 km from the N2 and Fijnbosch Game Lodge and Spa (offering accommodation for 20 in three chalets and one main lodge) situated roughly 4.5 km from the N2. The nearest turbines to Cob Creek would be 3 km distant to the north which is probably adequate to ensure low risks to Cob Creek given the tourism product it has to offer. The nearest turbines to the Fijnbosch Game

Lodge would be 2.5 km to the north and, at worst, would be partially visible from the lodge given the presence of a ridge near the lodge which shields views to the north. Risks to the lodge are also considered low given these factors.

For tourism establishments in Jeffrey's Bay the wind farm would be relatively distant. The nearest turbine would be roughly 6.3 km from the nearest houses in the Kabeljous-on-Sea part of Jeffrey's Bay. Impacts on existing tourism establishments or the tourism potential of Kabeljous-on-Sea would thus most likely be minimal due to this distance and the character of the area between Kabeljous-on-Sea and the wind farm. The visual specialist study notes that views to the north from Kabeljous-on-Sea often have the Van Staden's Mountains as a backdrop and are valued by residents and tourist visitors for their scenic qualities. However, it found that it is unlikely that wind turbines will intrude on scenic views to the north (see visual study in Chapter 8 of this report). Similarly the Kabeljous River Nature Reserve north of Kabeljous-on-Sea is roughly 5 km from the nearest turbines in the wind farm and visual exposure values for the reserve are low.

Notwithstanding the potential for relatively moderate impacts on the overall landscape level, high visual impacts on individuals have been predicted by the visual specialist study as one would expect given the size and nature of the project. However, the visual specialist study also notes that, with regard to potentially sensitive areas, it is not clear whether the wind farm will have a positive or negative impact as opinions on the aesthetic appeal of wind farms vary widely (see visual study in Chapter 8 of this report). It is also not clear that individual negative impacts (should they arise) will result in collective impacts that are significant enough to create significant risks for tourism.

Discussions with the tourism associations, and municipal officials responsible for tourism, revealed that they have relatively high levels of concern with regard to the project and other wind farms in the area.[5] Their key concern is essentially that this project and others are of such a scale that they would change the overall character of the area thereby risking a detraction from its tourism appeal. Potential cumulative impacts are therefore their key concern (see Section 10.4.7 for a further discussion of cumulative impacts). Although it is recognised by the tourism authorities that the Kouga area is built up in many places, it largely has managed to maintain a relatively natural sense of place which is a key tourism draw-card. There is a general recognition for the need for renewable energy among tourism stakeholders. However, achieving this with no or minimal risks to tourism is seen as preferable if possible.

Drawing on the visual assessment and international experience, it is seems most reasonable to conclude that the development would make a significant change to the current sense of place of the site and would not be without tourism risks. However, these would be mitigated by the site's location and the lack of particularly sensitive tourism receptors nearby. They are thus expected to be of a low to medium level noting the low to medium level of confidence that one can attach to this kind of assessment (i.e. tourism impacts of a largely unknown type of development in South Africa)

[5] Discussions were held with Mrs J Prinsloo (Kouga and Humansdorp Tourism chairperson), Ms K Nelani (Kouga Municipality LED and Tourism Department) and Mr Andy Thuysman (Jeffrey's Bay Tourism chairperson and Supertubes Surfing Foundation representative on environmental matters)

10.4.5.2 Positive impacts

Potential positive impacts on tourism would stem from the potential attraction that a wind farm would introduce. Wind farms are certainly a rarity in South Africa and can create a visual spectacle that may appeal to tourists. This is not to say that tourists would visit the area specifically to see the wind farm (although this is a possibility). Rather, it seems likely that the wind farm could add somewhat to the overall tourist experience in the area particularly while it remains novel. Note that the facility is only likely to appeal to certain tourists and positive impacts are likely to be of a short term nature and of a low significance.

Aside from potential benefits through visiting and/or viewing the facility, it also has the potential to contribute to the tourism package on offer in the area through its potential to enhance the 'sustainable tourism' or 'eco-friendly' brand of the area. Numerous examples can be found of individual tourism establishments and wider tourism areas that have used initiatives such as renewable energy installations, recycling programmes, rehabilitation programmes, etc. to their advantage. These initiatives are commonly used to enhance general reputation and credibility. In some cases they are part of a focused strategy that actively markets high levels of eco-friendliness or sustainability.

10.4.5.3 The balance between positive and negative impacts

Arriving at an assessment of the overall risk to tourism needs to be recognised as an exercise with high levels of uncertainty given the total lack of experience with wind farms in South Africa and widely diverging views regarding their aesthetic appeal in different contexts. Nevertheless, considered as a whole, the key potential drivers of negative tourism impacts (primarily visual impacts) do not seem to be significant enough to provide any clear basis to conclude that the project would entail more than a low to medium level of risk for tourism with mitigation (see summary impact rating table at the end of Section 5). In the short term, whilst novel, it is possible that this risk would be somewhat off-set by the positive attraction provided by the project.

Some disturbance and nuisance would be experienced during construction. This would include the potential for increased dust and noise as well as increased social risks associated with a large workforce. Impacts should, however, be minimal provided the construction phase is well managed and the mitigation measures suggested by the other specialist studies forming part of the EIA are implemented. Impacts during construction are thus expected to be low with mitigation.

The "no-go" would have no impact relative to the status quo with regard to tourism.

It should be borne in mind that the balance between positives and negatives as well as the significance of tourism impacts are difficult to predict as they are primarily reliant on the perceptions of tourists some of whom may find that the project detracts from their experience and others who may not. Confidence in assessment is thus low to medium.

<u>Mitigation measures</u>

- Impacts on tourism are dependent on how the site is developed and managed to minimise negative biophysical impacts. The measures recommended in other specialist reports to these impacts (primarily the minimisation of visual, noise and ecological impacts) would thus also minimise tourism impacts.

10.4.6 Impacts linked to expenditure on the construction and operation of the development

The construction and operational phase of the project would both result in a positive spending injection into the area that would lead to increased economic activity best measured in terms of impacts on employment and associated incomes in the local area and region.

All new expenditure will lead to linked direct, indirect and induced impacts on employment, incomes and production. Taking employment as an example, impacts would be direct where people are employed directly on the project in question (e.g. jobs such as construction workers), indirect - where the direct expenditure associated with a project leads to jobs and incomes in other sectors (e.g. purchasing building materials maintains jobs in that sector) and induced where jobs are created due to the expenditure of employees and other consumers that gained from the project. Direct impacts are the most important of these three categories as they are the largest and more likely to affect the local area. Their estimation also involves the lowest level of uncertainty. The quantification of indirect and induced impacts is a far less certain exercise due to uncertainty surrounding accurate multipliers particularly at a local and regional level. This uncertainty makes it inadvisable to quantify indirect employment unless an in-depth analysis is required. Potential direct employment and income impacts are consequently quantified here and likely indirect impacts are considered in a qualitative sense when providing overall impact ratings.

10.4.6.1 Construction phase impacts

Construction expenditure would not displace other investment and would constitute a positive injection of new investment. During the construction phase the civil and other construction, specialised industrial machinery, and building construction sectors would benefit substantially. The development would provide a major injection for contractors and workers in the area that would in all likelihood purchase goods and services in Jeffrey's Bay, Humansdorp, Hankey and the wider region.

Preliminary estimates indicate that a total of approximately R1.6 billion would be spent on the entire construction phase including infrastructure and building construction as well as turbine and other specialised machinery installation (see Table 10.6). The majority of the machinery and equipment such as the turbines will have to be imported as these items are not currently available in South Africa. Notwithstanding the need for relatively high proportions of imports, the construction of the project represents a significant investment spread over roughly one year. It should be borne in mind that the estimates are not to be regarded as highly accurate and are subject to revision. They are relatively coarse estimates only meant to give an approximate indication of potential expenditure.

Table 10.6: Construction phase expenditure (in 2011 Rands)

	Cost in 2011 rands over roughly one year	% of total costs that would go to suppliers in the local municipal area	% of total costs that would go to suppliers in the rest of the Eastern Cape	% of total costs that would go to suppliers in the rest of South Africa	% of total costs for imports
Civils and all buildings	R 500 000 000	29%	65%	16%	0%
Machinery & equipment	R 1 100 000 000	0.5%	0.5%	11%	88%
Total	R 1 600 000 000				

Note: Machinery & equipment such as turbines are presently only available through import. Should this change, the need to import will decrease.

10.4.6.1.1 Employment during construction

In order to estimate direct temporary employment during construction standard construction industry estimates for labour required were used. The levels of employment that would be associated with the two main components of the construction phase over roughly one year are presented in Table 10.7. Roughly 187 jobs of one year's duration would be associated with the entire construction phase with the majority of jobs in the low and medium skill sectors as expected. Again, the estimates are not to be regarded as highly accurate and are meant to give an indication of potential employment impacts.

Table 10.7: Estimated direct temporary employment during construction

	Number of workers				Duration of employment
	Highly skilled	Medium skilled	Low skilled	Total	
Construction component					
-Civils and Building	7	30	80	117	8 -12 Months
-Installation of machinery and equip	10	20	40	70	8 -12 Months
Total	17	50	120	187	

Estimates of how much employment is likely to go to workers from different areas are presented in Table 10.8. It is anticipated that approximately 80 jobs of one year's duration would be allocated to workers from the Kouga Municipality, a further 72 to workers from the Eastern Cape, 9 to workers from the rest of the country and 24 to overseas workers given the need for specialist skills not available in South Africa.

Table 10.8: Estimated direct temporary employment per area during construction

	Construction workers			
	High skill	**Medium skill**	**Low skill**	**Total**
Anticipated % of workers from the Kouga municipal area	0%	20%	60%	
Number from the Kouga municipal area	-	10	72	**82**
Anticipated % of workers from the rest of the Eastern Cape	25%	40%	40%	
Number from the rest of the Eastern Cape	4	20	48	**72**
Anticipated % of workers from the rest of South Africa	25%	10%	0%	
Number from rest of SA	4	5	-	**9**
Anticipated % of workers from overseas	50%	30%	0%	
Number from overseas	9	15	-	**24**
Total	17	50	120	**187**

10.4.6.1.2 Household incomes linked to wages during construction

Direct household income impacts would flow from all wages paid during construction. These were estimated by multiplying the projected number of direct jobs associated with the project above by assumed average monthly salaries for each skill category (i.e. R4,200 for low skilled, R10,000 for medium skilled and R20,000 for highly skilled employees). Again, these estimates are to be treated as indicators. The results of this exercise indicate that incomes flowing to workers from the Kouga Municipality would probably amount to R9.7 million over the course of the project, R11.7 million would accrue to workers from the rest of the Eastern Cape, and R3.2 million to workers from the rest of the country (Table 10.9).

Table 10.9: Direct household income per area during construction (2011 Rands)

	Direct income during construction			
	High skill	**Medium skill**	**Low skill**	**Total**
Workers from the Kouga Municipality	R 0	R 2 400 000	R 7 257 600	R 9 657 600
Worker from the rest of the Eastern Cape	R 2 040 000	R 4 800 000	R 4 838 400	R 11 678 400
Workers from the rest of SA	R 2 040 000	R 1 200 000	R 0	R 3 240 000
Workers from overseas	R 4 080 000	R 3 600 000	R 0	R 7 680 000
Total	**R 4 080 000**	**R 8 400 000**	**R 12 096 000**	**R 24 576 000**

10.4.6.2 Operational phase impacts

Once established, the operation of the facility would result in direct and indirect economic opportunities. These would stem from expenditure on operations including expenditure on employees that would not otherwise have occurred, particularly in the local area. Estimates of operational costs and where operational goods and services would be sourced from are highly preliminary at this stage. It is anticipated that roughly R20.9 million would be spent annually on operations (Table 10.10). As with construction, a high percentage (roughly 70%) of this would initially be imported given the limited availability particularly of highly skilled engineers. It is hoped that after 5 years or so, local skills will have been built up to the required level and maintenance engineering companies will have been established in response to projects like the Ubuntu Wind Energy Project so that the importation of these services will no longer be necessary. Aside from engineering services, all other operational costs would entail purchases of goods and services mostly from the local area and/or region resulting in an ongoing investment injection.

Table 10.10: Preliminary estimate of operational expenditure (2011 Rands)

Operational cost categories	Annual costs once project is fully operational	% of total costs that would go to suppliers in the Icoal municipal area	% of total costs that would go to suppliers in the rest of the Eastern Cape	% of total costs that would go to suppliers in the rest of South Africa	% of total costs for imports
Salaries and wages	R 2 000 000	20%	30%	50%	0%
Municipal services	R 100 000	100%	0%	0%	0%
Outsourced engeneering services	R 15 800 000	0%	20%	0%	80%
Sundry supplies	R 1 000 000	80%	20%	0%	0%
Insurance, community benefits etc	R 2 000 000	70%	10%	20%	0%
Total costs once fully operational	**R 20 900 000**				

10.4.6.2.1 Employment during operations

The expected direct employment during operations is presented in Table 10.11. In keeping with the relatively low maintenance and high technology nature of the facility, it is expected that approximately 10 direct employment opportunities will be created by the project equally spread across skill levels. Although high skill positions will probably have to initially be filled by imported technicians, medium and low skill positions will offer opportunities for locals and those from the region.

Table 10.11: Employment associated with activities on the site during operations

	Number of employees			
	Highly skilled	Medium skilled	Low skilled	Total
Operational jobs once fully operational	2	4	4	10

Aside from these direct employment opportunities, the operational expenditure on the project (detailed above) and the spending of those employed directly would result in positive indirect impacts on the local and regional economy.

10.4.6.2.2 Opportunities associated with growing the national wind energy sector

The potential for the Ubuntu Wind Energy Project and other future wind energy projects to result in greater impacts on local economies and the South African economy as a whole is primarily dependent on economies of scale. Currently, import content is necessarily high. However, if the wind programme grows in size (aided by projects such as the Ubuntu Wind Energy Project) it should provide opportunities for manufacturing and servicing at local scale and the additional benefit that would flow from it. Marquad *et al.* (2008) point out that opportunities for competing with overseas firms on a cost basis in manufacturing are minimal at present, and an extensive wind programme would initially be implemented with imported equipment and using international expertise. However, according to Marquad *et al.* (2008), the introduction of a large-scale programme could provide local economic opportunities for component manufacture, and with an appropriate industrial policy it would be possible to leverage South Africa's relatively cheap steel resources. The distance from other international manufacturers will also confer a competitive advantage, especially for less-specialised large-scale components such as steel towers.

10.4.6.3 Significance of impacts

An assessment of the significance of the combined impacts of project-related expenditure on increased employment and incomes based on the findings above (both without and with mitigation measures) is presented at the end of Section 5. Impacts with mitigation would be of a medium significance during construction given the size of the expenditure injection and the number of potential employment and income generation opportunities involved. Similarly, new impacts during operations would be of a medium significance with mitigation. With time local impacts should become more pronounced as the sourcing of labour, goods and services becomes easier.

The no-go would have no impact relative to these benefits as there would be no expenditure injection.

<u>Mitigation measures</u>

Mitigation in the form of benefit enhancement should focus on three areas:

1. Targets should preferably be set for how much local labour should be used based on the needs of the proponent and the availability of existing skills and people that are willing to undergo training. Opportunities for the training of unskilled and skilled workers from local communities should be maximized.
2. Local sub-contractors should be used where possible and contractors from outside the local area that tender for work should also be required to meet targets for how many locals are given employment.
3. The proponent should continue to explore ways to enhance local community benefits with a focus on broad-based BEE through mechanisms such as community shareholding schemes, trusts, preferential procurement, etc. In accordance with the relevant BEE legislation and guidelines, if the proponent wishes to maximise BEE points a minimum of 4% of after tax profit would need to find its way into community upliftment and enterprise

development initiatives over and above that associated with expenditure injections into the area.

Operationalising the first two measures is challenging and it is difficult to decide on appropriate targets and ensure they are reached. It is thus recommended that the proponent should draft proposals regarding targets with reasons for their choice for inclusion in the EMP. These should include targets for (1) the percentage of the total construction contract value that should go to local contractors and (2) the percentage of total labour requirement that should be met using local labour. Targets should then be negotiated further with the local economic development authorities in the local municipality before any tendering is done.

Note that the national government has signalled its intention to place significant emphasis on the local economic development initiatives which wind project developers propose when deciding which wind projects to support financially. This should ensure that only wind projects which have paid significant attention to this aspect will be given the financial support required to go ahead.

10.4.7 Cumulative impacts

Cumulative impacts are defined as those impacts on the environment, which result from incremental impacts of an action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (CEQ, 1997).

The impact assessments, including significance ratings, discussed in the foregoing sections of this study have encompassed all impacts including those of a cumulative nature. Specific comment on their cumulative nature has been provided where relevant. This section provides further consolidated discussion of these impacts in order to provide greater clarity. Also it should be borne in mind that the distinction between cumulative and other impacts is often extremely difficult to make. The assessment of cumulative impacts also is more difficult mainly because they often require more onerous assumptions regarding the likely actions of others.

The wind projects in the region currently either in the application stage or with approvals in place are listed in Table 10.12.

Table 10.12:Wind projects planned in the Kouga region

Environmental Practitioner	Last document released, approval status	Applicant	Location	Number of Turbines	Capacity MW
Savannah Environmental (Pty) Ltd	Draft EIA Report	VentuSA Energy Corp (Pty) Ltd	Dieprivier Mond, 17km west of Humansdorp north of the N2	50	100
Savannah Environmental (Pty) Ltd	Background Information Document	African Clean Energy Developments (Pty) Ltd	Near Cookhouse in the Eastern Cape	Up to 50 turbines	Capacity not indicated in BID
Savannah Environmental (Pty) Ltd	Draft EIA Report	VentuSA Energy Corp (Pty) Ltd	Happy Valley, 3 km west of Humansdorp near the N2	20	40
Savannah Environmental (Pty) Ltd	Draft Scoping Report	Exxaro Resources and Watt Energy (Pty) Ltd Tsitsikamma community	The proposed site is situated approximately 30 km west of Humansdorp, south of the N2 National Road in the Tsitsikamma area	Maximum of 50	100MW
CSIR	Environmental Authorisation granted (April 2011)	Mainstream SA	Between Jeffrey's Bay and Humansdorp north of the N2	40 to 85	180
CSIR	Draft Scoping Report	Windcurrent SA	Banna Ba Pifhu, 3.5 km south of Humansdorp	14 - 25	50
Arcus Gibb http://projects.gibb.co.za/Projects	Environmental Authorisation granted (June 2011)	Redcap Invest.	Western Sector to the east of the Tsitsikamma River	50 to 150	100 to 300
			Central Sector near Oyster Bay		
			Eastern Sector north of St Francis Bay		

The key source of potential negative cumulative impacts identified in this assessment is the proposed development's risk to tourism when combined with other planned wind farm projects in the area (see Table 10.12). Those with environmental approvals in place are particularly pertinent and include the Mainstream proposal between Jeffrey's Bay and Humansdorp and the Red Cap proposal in three locations near St Francis Bay, Oyster Bay and adjacent to the Tsitsikamma River (see Appendices 2 and 3 respectively for maps of these proposals). The concern would be that if these projects and others go ahead along with the Ubuntu project, the area would become dominated by wind turbines with consequences for tourism. Should they all go ahead, turbines would certainly become a prominent feature of the local environment and this would not be without risks. The likelihood of this is however very small due to the nature of the competitive tendering process for the long-term Power Purchase Agreements. It is these risks among others that have prompted the drafting of guidelines with regard to wind farm location (CNdV, 2006 and Environomics, 2011). However, it is not clear how significant these risks would be particularly in the absence of a regional study focusing on this question. The lack of such a study in the area should be viewed as a significant information gap. In the absence of such a study, it is probably reasonable to tentatively rate cumulative risks as low to medium particularly when one considers the international literature on the subject (see Section 10.4.5) and the findings of the visual specialist studies for the projects in question which have not identified situations of serious concern.

Positive cumulative impacts are also likely as the project should set a positive precedent for further investment in the area. By committing to investment in a large development, the proponent would be casting a strong 'vote of confidence' in the local economy. This has the potential to influence other investors (including locals) to also act with similar confidence thereby resulting in cumulative impacts on overall investment levels. In a sense the project and other wind projects have the potential to lead to the 'crowding in' of further investment. As has been noted, if the wind energy industry grows in size (aided by projects such as the Ubuntu Wind Energy Project) it should provide opportunities for manufacturing and servicing at scale and the additional, cumulative benefit that would flow from it.

Table 10.13:Summary table of impacts

Nature of impact	Status (Negative or positive)	Extent	Duration	Intensity	Probability	Significance (no mitigation)	Mitigation/Management Actions	Significance (with mitigation)	Confidence level
Construction Phase over approximately 1 year									
1.1. Impacts on land owners and land uses on the site	**Negative**	**Local**, i.e. on site	**Short**, i.e. 1 year	**Low**, since construction activity would be relatively localised to smaller areas relative to each land parcel	**Highly probable**, since construction will entail significant activity on site	**Low**, since footprints would be minimal, farming can continue and owners would be paid for use of their land	Implement recommendations of noise, visual, ecological, bird and bat specialist studies. Adequate setbacks from buildings, structures and residences to be strictly enforced.	**Low**, since mitigation, e.g. limit footprints, locate turbine appropriately, will further limit negative impacts	**Medium**, since based on new and not well known type of land use
1.2. Impacts on surrounding land users	**Negative**	**Local,** i.e. on surrounding lands	**Short**, i.e. 1 year	**Low**, since construction activity would be relatively localised to smaller areas relative to each land parcel	**Highly probable**, since construction will entail significant activity on site	**Low**, since farming and other activities can continue	Implement recommendations of noise, visual, ecological, bird and bat specialist studies. Adequate setbacks from borders and residences in particular to be enforced.	**Low**, since farming and other activities can continue	**Medium**, since based on new and not well known type of land use
1.3. Impacts associated with project investment / expenditure	**Positive**	**Local, regional and national**	**Short**, i.e. 1 year	**Medium,** since construction expenditure would be a significant injection	**Highly probable**, since construction will entail significant activity on site and investment	**Medium,** given significance of injection relative to economy	Set targets for use of local labour and maximise opportunities for training. Use local sub-contractors where possible Explore ways to enhance local community benefits with a focus on broad-based BEE through mechanisms such as community shareholding schemes and trusts.	**Medium,** given significance of injection relative to economy	**High,** since based on known investment amounts

Nature of impact	Status (Negative or positive)	Extent	Duration	Intensity	Probability	Significance (no mitigation)	Mitigation/Management Actions	Significance (with mitigation)	Confidence level
Operational Phase over approximately 25 years									
1.1. Impacts on land owners and land uses on the site	**Positive**	**Local**, i.e. on site	**Long**, i.e. 25 years	**Low to Medium**, since farmers would be compensated and risks would be relatively minimal	**Highly probable**, since structures will be permanent and operations would continue for at least 25 years	**Low to Medium**, since footprints would be minimal, farming can continue and owners would be paid for use of their land	Implement recommendations of noise, visual, ecological, bird and bat specialist studies. Adequate setbacks from buildings, structures and residences to be strictly enforced.	**Medium**, since mitigation will further limit negative impacts	**Medium**, since based on new and not well known type of land use
1.2. Impacts on surrounding land users	**Negative to Neutral**	**Local,** i.e. on surrounding lands	**Long**, i.e. 25 years	**Low,** since risks are considered manageable	**Highly probable**, since structures will be permanent and operations would continue for at least 25 years	**Low Negative**, since farming and other activities can continue	Implement recommendations of noise, visual, ecological, bird and bat specialist studies. Adequate setbacks from borders and residences in particular to be enforced.	**Low Negative to Neutral**, since farming and other activities can continue	**Medium**, since based on new and not well known type of land use
1.3. Impacts on tourism	**Negative**	**Regional**	**Long**, i.e. 25 years	**Low to medium,** since risks are considered manageable	**Highly probable**, since structures will be permanent and operations would continue for at least 25 years	**Low to Medium,** considering risks and opportunities	The measures recommended in other specialist reports to minimise biophysical impacts (primarily the minimisation of visual, noise and ecological impacts) would also minimise tourism impacts.	**Low to Medium,** considering risks and opportunities	**Low to Medium,** since tourism behaviour difficult to predict
1.4. Impacts associated with project investment / expenditure	**Positive**	**Local, regional and national**	**Long**, i.e. 25 years	**Medium,** since operational expenditure would be a significant injection	**Highly probable**, since expenditure on operations would continue for at least 25 years	**Medium,** given significance of injection relative to economy	Set targets for use of local labour and maximise opportunities for the training of unskilled and skilled workers. Use local sub-contractors where possible Explore ways to enhance local community benefits with a focus on broad-based BEE through mechanisms such as community shareholding schemes and trusts.	**Medium,** given potential for mitigation to enhance benefits	**High,** since investment, employment are known

10.5 CONCLUSION

When considering the overall costs and benefits of the project it was found that the latter should be more prominent allowing for the achievement of a net benefit. Benefits would be particularly prominent for the project proponents, land owners on the site and in the achievement of national and regional energy policy goals. The project would also result in significant positive economic spin-offs primarily because of the large expenditure injection associated with it.

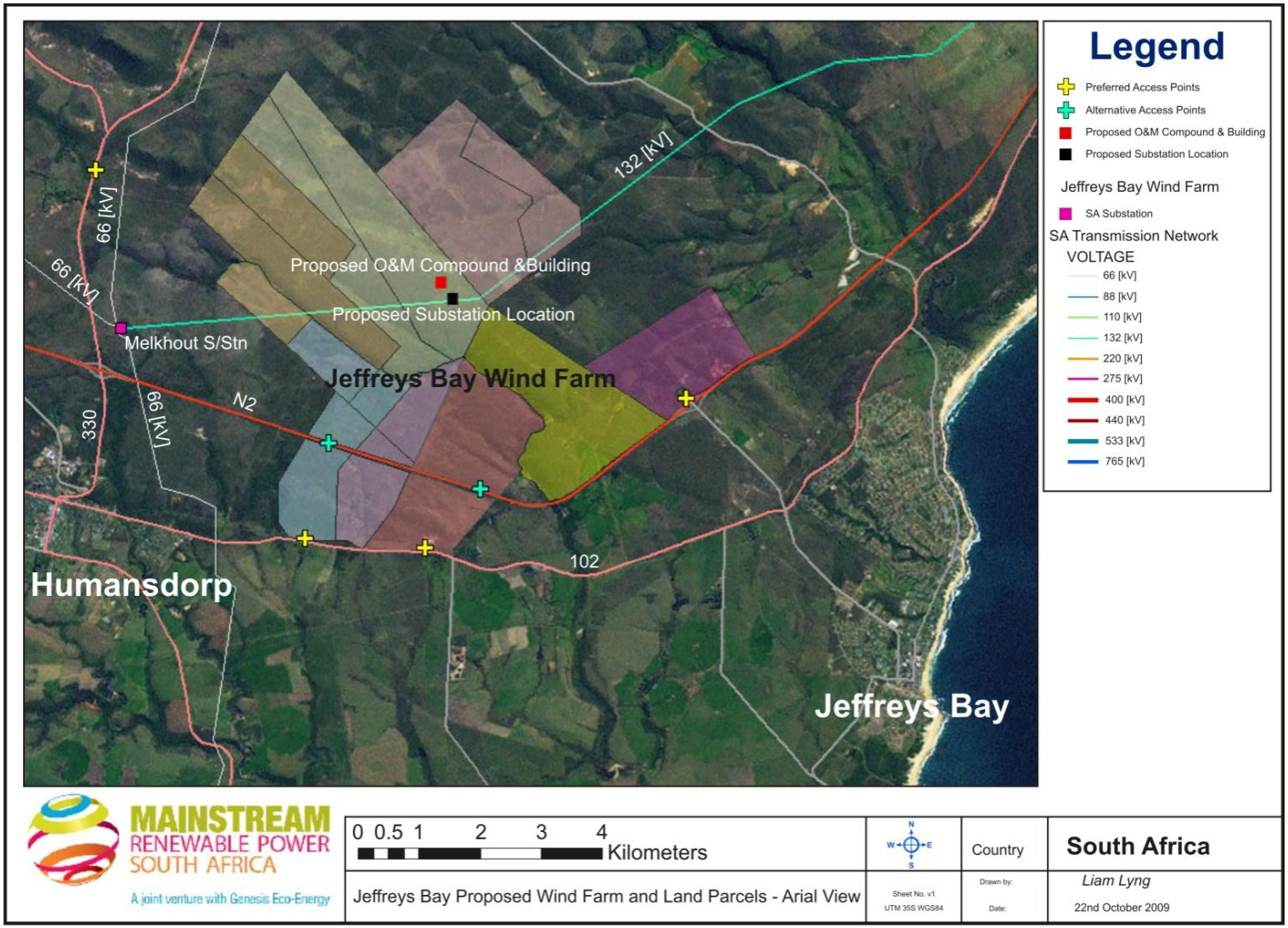
With respect to risks and negative impacts, these are difficult to assess accurately but should prove to be acceptable provided adequate mitigation is put in place much of which will revolve around optimal turbine locations. Tourism risks in particular are a source of concern when cumulative impacts are considered.

10.6 APPENDICES

Appendix 10.1: Disclaimer

The primary role of this study is to inform the decision-making processes being undertaken by the relevant environmental authorities with regards to the proposed project. Due care and diligence has been applied in the production of the study. However, ultimate responsibility for approving, denying or requiring changes to the proposed project application rests with the relevant environmental authorities (and other government bodies where relevant) who also bear responsibility for interrogating and determining how assessment information from this economic specialist study along with other information is to be used to reach their decisions. Independent Economic Researcher and Dr Hugo van Zyl can therefore not be held responsibility or liable for any consequences of the decisions made by the relevant environmental authorities with regard to the proposed project. This includes any financial, reputational or other consequences that such decisions may have for the applicant, the Environmental Assessment Practitioner responsible for conducting the Environmental Impact Assessment process or for the environmental authorities themselves.

Appendix 10.2: Location of proposed Mainstream Wind Energy Project



Source: Mainstream EIA done by CSIR, 2010

Appendix 10.3: Locations of proposed Red Cap Wind Energy Project

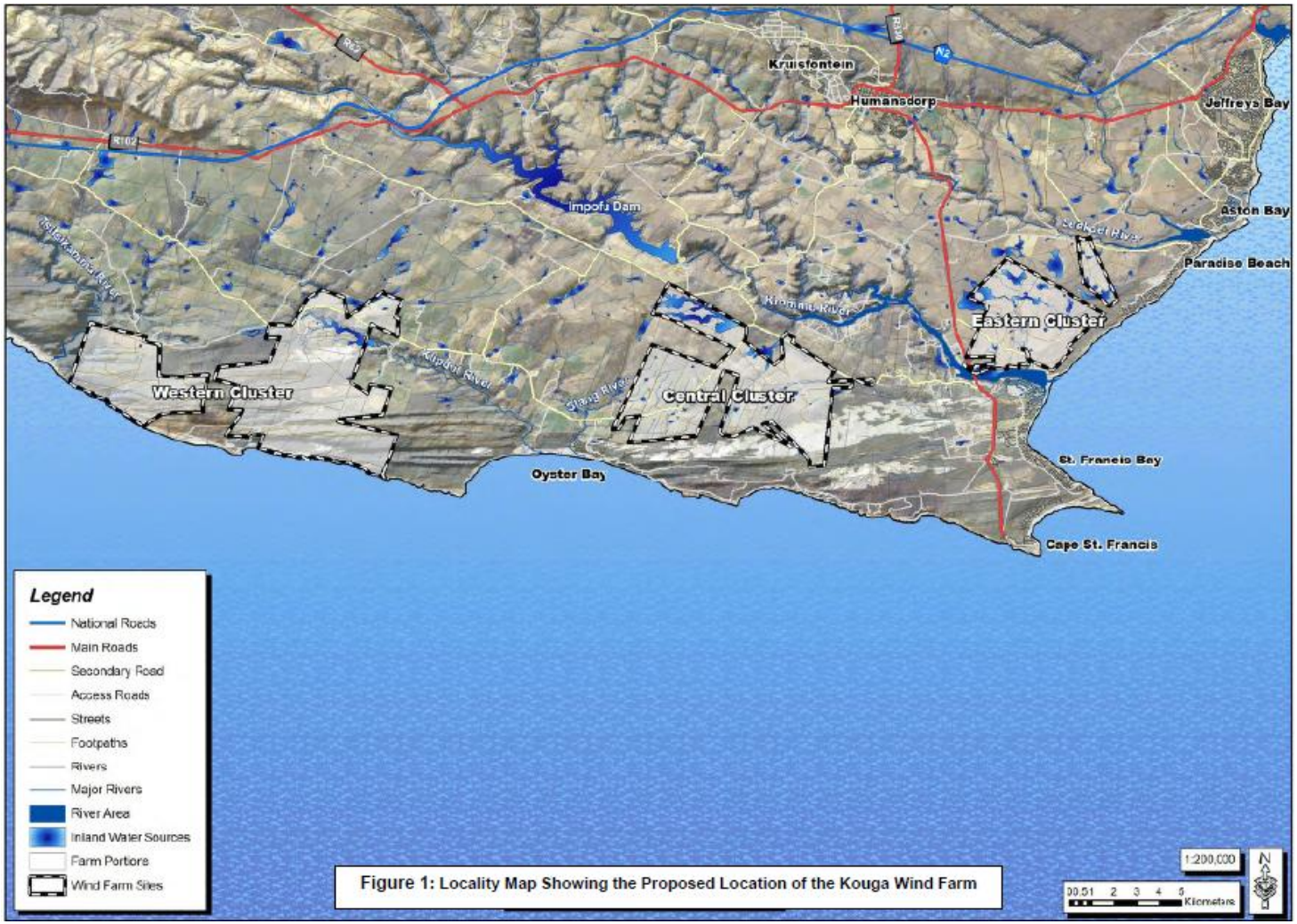


Figure 1: Locality Map Showing the Proposed Location of the Kouga Wind Farm

Source: Red Cap EIA done by Arcus Gibb, 2010