DRAFT SOCIO-ECONOMIC ASSESSMENT FOR THE ENVIRONMENTAL IMPACT ASSESSMENT OF THE:

Proposed Impofu East Wind Farm

April 2019

Prepared by:

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Requirement	Description
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Legal Requirements

Table 1 indicates the page references for the relevant requirements of the specialist reports (socio-economic) per EIA Regulations GN R. 982, as amended (4 Dec 2014).

Table 1: EIA Regulations – Specialist Impact Assessment Phase Reports

Section	Requirement	Page #
(1)	A specialist report prepared in terms of these Regulations must contain-	
(a)	details of-	
(i)	the specialist who prepared the report; and	2
(ii)	the expertise of that specialist to compile a specialist report including a curriculum vitae;	64
(b)	a declaration that the specialist is independent in a form as may be specified by the competent authority;	89
(c)	an indication of the scope of, and the purpose for which, the report was prepared;	9
(cA)	an indication of the quality and age of the base data used for the specialist report;	13
(cB)	a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change	26
(d)	the duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment	87
(e)	a description of the methodology adopted in preparing the report or carrying out the specialised process, inclusive of equipment and modelling used;	13; 30
(f)	details of an assessment of the specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of a site plan identifying site alternatives	29
(g)	an identification of any areas to be avoided, including buffers;	29
(h)	a map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers;	29
(i)	a description of any assumptions made and any uncertainties or gaps in knowledge;	12
(j)	a description of the findings and potential implications of such findings on the impact of the proposed activity, or activities;	33
(k)	any mitigation measures for inclusion in the EMPr;	33
(l)	any conditions for inclusion in the environmental authorisation;	33
(m)	any monitoring requirements for inclusion in the EMPr or environmental authorisation;	33
(n)	a reasoned opinion-	
(i)	whether the proposed activity or portions thereof should be authorised; and	59
(iA)	regarding the acceptability of the proposed activity or activities; and	59
(ii)	if the opinion is that the proposed activity or portions thereof should be authorised, any avoidance, management and mitigation measures	59

	that should be included in the EMPr, and where applicable, the closure plan;	
(o)	a description of any consultation process that was undertaken during the course of preparing the specialist report;	85
(p)	a summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	85
(q)	any other information requested by the competent authority.	N/A

Contents

Executive Summary

Red Cap Impofu East (Pty) Ltd is proposing the establishment of the Impofu East Wind Farm, consisting of up to 33 turbines (depending on the choice of turbine) and associated infrastructure, on a site located approximately 30 km from Humansdorp.

Urban-Econ Development Economists was appointed by Red Cap Impofu East (Pty) Ltd to undertake a specialist Socio-Economic Impact Assessment as part of the EIA process. This report contains the findings of the impact assessment phase investigation, subsequent to the initial scoping socio-economic study which was based on a review of desktop sources only. This study included targeted engagements with selected entities and individuals as well as identification and assessment of key socio-economic issues based on feedback from interested & affected parties. The assessment is also informed by Urban-Econ Development Economist's experience with Socio-Economic Impact Assessments for other wind energy developments in the Eastern Cape.

The selected study area is confined to the Kouga Local Municipality within the larger Sarah Baartman District Municipality. The Impofu East Wind Farm site is located in the rural/agricultural area of the south-western Eastern Cape, approximately 30 km southwest of the town of Humansdorp.

Almost all of the farms in the study area and surrounds are intensive, high production dairy farms with cultivated, kikuyu-based pasture plus additional fodder crops, both under irrigation, as well as non-irrigated. The dairy farms generally include a small percentage of beef cattle. There are macadamia nut orchards on one farm.

There are currently four operational wind farms either adjacent to or in close proximity to the proposed Impofu East Wind Farm. These include the: Kouga Wind Farm, Gibson Bay Wind Farm, Tsitsikamma Community Wind Farm and Jeffreys Bay Wind Farm.

The Sarah Baartman District's total population was estimated at 444 735 individuals in 2016 (Stats SA, 2016), of which the Kouga Local Municipality accounts for 21.4% (95 270) of this figure.

From an economic output perspective, the Kouga Local Municipality contributed approximately 27.1% of the district municipality's GDP in 2016 (Quantec, 2016). The largest sectors within the municipality in terms of GDP contribution in 2016 were finance and business services (26.4%), trade (21.3%), general government (16.6%) and manufacturing (11.2%). While only contributing a small proportion of GDP, the agricultural sector in the municipality is an important employer, employing 8 422 or 22.1% of the working age population. The tourism industry within the municipality is well established and characterised by a range of eco-tourism and adventure activities.

The unemployment rate within the Kouga Local Municipality was estimated at 13.7%, which was below the district figure (19.0%), while 30.1% of the population is considered to be not economically active. The latter is made of scholars/students, pensioners, and those who could not find work.

The investigation and assessment of the socio-economic impacts will be informed by Guidelines for Involving Social Specialists in EIA Processes adopted by the Department of Environmental Affairs and Development Planning in the Western Cape (Barbour, 2007). These guidelines have been endorsed at a national level. This approach will include:

- Identification of key interested and affected parties

- Targeted engagements with selected parties
- Identification and assessment of key socio-economic issues based on feedback from interested and affected parties
- Recommendations regarding mitigation/optimization and management measures to be implemented

The key conclusions of this socio-economic study are as follows:

- The establishment of the Impofu East Wind Farm is supported at a national and provincial level as evident in policy and planning documents.
- The project will contribute to the Renewable Energy Independent Power Producer Procurement Programme (REI4P). As part of the programme, the following commitments have been made across the seven bid windows (SAWEA, 2019):
    - Procure 6 422 MW of electricity from 112 RE Independent Power Producers (IPPs) of which 17 are in the Eastern Cape;
    - Attract investment (equity and debt) to the value of R201.8 billion, of which R48.8 billion (24%) is foreign investment;
    - Create 31 207 job years[1] for South African citizens;
    - Contribute as of 2017, R357.4 million to socio-economic development;
    - Contribute as of 2017, R115.2 million to enterprise development;
    - Reduce carbon emissions by 15.4 million tons of CO^2.
- The Impofu East Wind Farm appears to be compatible with the economic development vision of the Sarah Baartman District Municipality and the Kouga Local Municipality.
- The potential positive impacts associated with the construction phase of the proposed wind energy facility relate to GDP growth, local and preferential procurement (BBBEE, women-owned vendors, etc.), local economic and enterprise development benefits, the creation of employment and skills development opportunities, all of which are aligned with the Department of Energy's Renewable Energy Independent Power Producer Procurement Programme. The potential negative impacts include the development affecting the areas sense of place as well as the presence of migrant construction workers on the site and in the area. An increase in crime levels is also possible without mitigation measures in place.
- The potential positive impacts associated with the operational phase relate to GDP growth, local and preferential procurement (BBBEE, women-owned vendors, etc.), local economic and enterprise development benefits, the creation of employment and skills development opportunities and the promotion of clean and renewable energy, all of which are aligned with the Department of Energy's Renewable Energy Independent Power Producer Procurement Programme. The potential negative impacts are linked to the impact on the rural sense of place and scenic integrity of the landscape. In the unlikely event that such negative impacts do occur, the impact is likely to be small given the transformed nature of the landscape and the close proximity of the development to existing turbines.

Based on this EIA, the information available suggests that, from a socio-economic perspective, that proposed development is acceptable and that the positive socio-economic impacts, will far outweigh the limited number of negative impacts. The project should thus be authorised. No conditions are recommended for authorisation from a socio-economic perspective.

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

Chapter 1 Introduction

Aurecon South Africa (Pty) Ltd, (hereafter referred to as Aurecon) has been appointed by Red Cap Energy (Pty) Ltd (hereafter referred to as Red Cap) to undertake the Environmental Impact Assessment (EIA) process for the Impofu East Wind Farm, and the Basic Assessment (BA) process for the associated Grid Connection Project, in the Eastern Cape, South Africa. These services are to ensure compliance with the relevant environmental legislation, and are to include applications to various Competent Authorities for environmental authorisations, licenses and permits.

Urban-Econ Development Economists was appointed by Red Cap Impofu East (Pty) Ltd to undertake a specialist Socio-Economic Assessment as part of the EIA process. The terms of reference for this study includes the identification of potential key social and economic issues, an assessment of their impacts, and proposals on any mitigation measures that may be required to address them. This report contains the findings of this assessment.

1.1 Terms of Reference

The terms of reference for the impact assessment report require:

- A focussed and relevant description of all baseline characteristics and conditions of the receiving environment (e.g. site and/or surrounding land uses including urban and agricultural areas as applicable), based on all relevant available data, reports and maps, and information obtained from any field work investigations undertaken to date.
- A detailed evaluation of the predicted impacts of the project on the receiving environment, or of the receiving environment on the project, that uses the criteria of extent, duration and intensity to quantify the significance of the potential impact. The evaluation of impacts should include:
    - An assessment of impacts for all phases of the life-cycle of the project, namely construction, operation, and decommissioning phases, as well as the direct and indirect impacts;
    - An assessment of the probability of each impact occurring, the reversibility of each impact and the level of confidence in each potential impact;
    - An assessment of the significance of each impact before and after mitigation;
    - The identification of any residual risks that will remain after implementation of design and planning mitigation; and
    - An assessment of the No-Go option.
- Consider and evaluate the cumulative impacts in terms of the current and proposed activities in the area.
- Recommendations to avoid negative impacts. Where this will not be possible then provide feasible and practical mitigation, management and/or monitoring options to reduce negative impacts and enhance positive impacts that can be included in the Environmental Management Programme.
- Identify any additional measures to ensure that the project contributes towards sustainability goals or provides a positive contribution to the environment.
- Where relevant, recommendations and instructions regarding any additional authorisation, permitting or licensing procedures, or any other requirements pertaining to legislation and policies relevant to the Specialist's field of interest.
- An outline of recommended measures to manage residual impacts (i.e. impacts that remain after optimisation of design and planning) for the construction and operation phases with an indication of the following:

    - Who should be responsible for implementation of mitigation;
    - Details of frequency of implementation of each measure; and
    - Envisaged outcome of each action.
- Recommendation of a monitoring plan for the relevant aspects associated with the specialist's field of expertise, if required.

1.2 Project Description, Location and Surrounding Land Use

Red Cap is proposing three wind farms on a consolidated site, the Impofu North, the Impofu West and Impofu East Wind Farms respectively. The approximately 5 142 hectares (ha) where the Impofu East Wind Farm is proposed to be developed is located in the Kouga Local Municipality within the greater Sarah Baartman District Municipality. The site lies directly to the north-west of the small coastal village of Oyster Bay. It is bounded by the operational Gibson Bay Wind Farm to the west and the Kouga Wind Farm is located in close proximity to the east. The Tsitsikamma Community Wind Farm is approximately 5 km to the north-west. The construction of the approved Oyster Bay Wind Farm on its eastern boundary will most likely commence in 2019.

This area lies on a section of coastal plain in close proximity to the ocean on either side which results in excellent wind conditions and low levels of turbulence, making it one of the best wind resources in the country and ideal for wind farm development.

The proposed wind farm will be named the Impofu East Wind Farm. An estimated 33 turbines are proposed for Impofu East Wind Farm and this will be the basis of the application for Environmental Authorisations. At this point in time the megawatt (MW) size of the turbine to be used has not been finalised, but it is assumed it would be from about 3-6 MW. Given that neither the number of turbines, nor the MW capacity per turbine have been finalised, it is not yet possible to indicate the maximum MW capacity for Impofu East Wind Farm, at this point in the process.

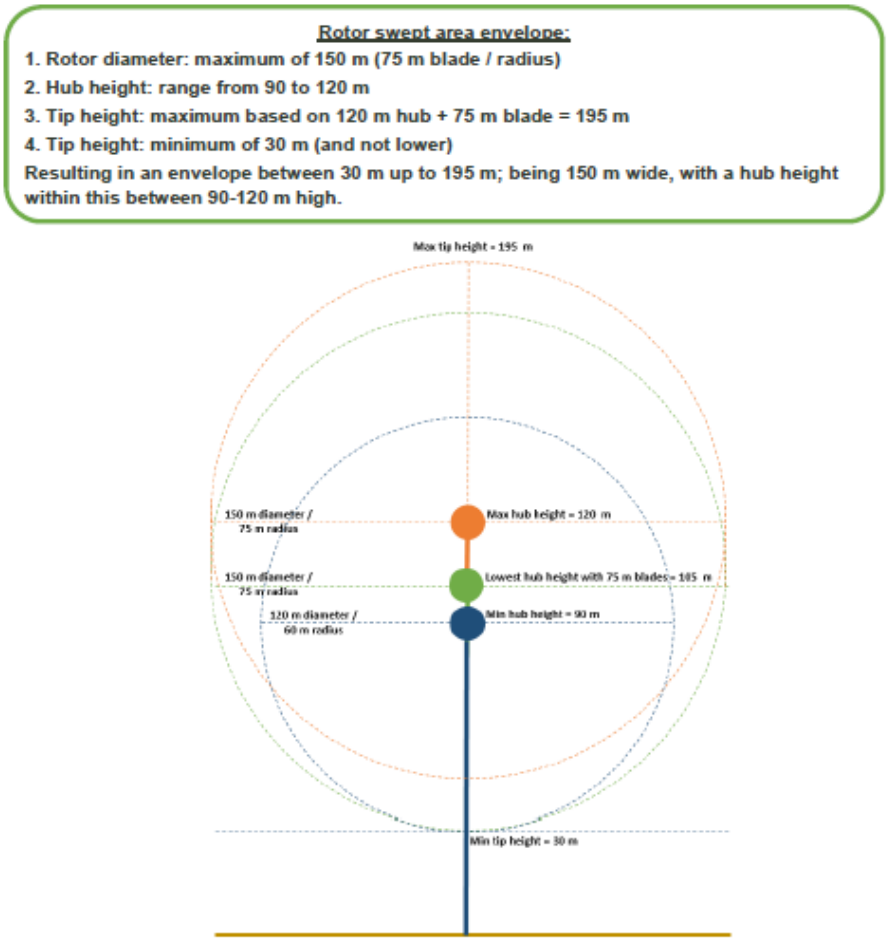
Each of the proposed turbines would have a circular foundation of approximately 20-25 m diameter, a temporary disturbed area including the foundation, the hardstand and construction area of approximately 100 x 50 m for use as a laydown area and to accommodate a crane pad during installation, with a permanent hardstand footprint of approximately 50 x 30 m remaining for maintenance purposes.

Since the turbine technology is continually improving it is not possible at this early stage in the development process to know the exact turbine model and specification. Assumptions have thus been made for assessment purposes regarding the potential worst-case extent of the area to be impacted by the turbine blades (the rotor swept area envelope). These are as follows, and graphically represented in Figure 1.1.

The supporting infrastructure within the site includes roads, underground and overhead medium voltage (MV) power lines (33 kV or lower) and substations (including control, operation, workshop, storage buildings / areas).

The internal gravel roads will be approximately 6 m wide with potential side drains along the side and of a specification to accommodate the abnormal trucks that will deliver the turbine components. Where possible existing roads will be used and upgraded to avoid additional clearance of natural or agricultural land cover. In exceptional circumstances short sections of the roads may be surfaced with bitumen or concrete if they are excessively steep.

Figure 1.1: Rotor swept area and envelope



The wind farm application will include the 33 or lower kV MV lines that would transfer the power generated from the turbines to an on-site substation (with a transformer). These lines would predominantly be in the form of underground cables, but in cases where they have to cross complex terrain such as drainage lines or steep kloofs, they would be short sections of overhead power lines.

The applicable substation is named the Impofu East substation and would have an associated switching station. The switching station component is part of the separate Grid Connection Application and will be owned by Eskom, there will be a physical barrier between the two components in the form of a fence. Also part of the separate Grid Connection Application, is a short separate 132 kV high voltage (HV) overhead power line that links the Impofu East switching station to a combined central "collector switching station" (Impofu collector switching station) on Impofu West. The role of the collector switching station is to consolidate the three power lines from all of the three proposed wind farms (Impofu North, Impofu West and Impofu East) into one, such that a single line continues from here onwards as the 132 V HV Grid Connection transmission line.

The total footprint of the substation is approximately 150 x 75 m (11,250 m^2) and the adjoining Eskom switching station is of a similar size. The substation area will include all the standard substation electrical equipment such as transformers and bus bars, and the area will also house the control, operation, workshop, storage buildings / areas.

1.3 Assumptions and Limitations

1.3.1 Assumptions

- **Identification of area for the wind energy facility**
  The identification of the proposed site was informed by technical information relating to the local climatic conditions in the area, specifically wind conditions, local topography, land availability and environmental constraints identified through the development process of three operational wind farms in the immediate vicinity.

- **Strategic importance of the project**
  The importance of promoting wind energy and other renewable sources of energy generation are supported and highlighted by a number of national and provincial polices.

- **Technical suitability**
  It is assumed that the development site identified by Red Cap represents a technically suitable site for the establishment of a wind energy facility.

- **Construction and operational costs**
  A detailed costing of the proposed Impofu East wind farm and associated infrastructure will only be known just prior to construction. Red Cap has provided the specialist with projected capital and operational expenditure figures based on the size of the development, as well as estimated employment figures both during construction and once the wind farm is operational. These estimated figures were as follows:

    - Estimated capital expenditure of R1.08 billion of which approximately R965.8 million would be incurred on procurement spending and approximately R120.7 million on labour costs.
    - Annual operational expenditure is estimated at R14.2 million, the majority of which (64.4%) will be spent on labour costs (R9.1 million), with the remaining 35.6% spent on procurement of goods and services (R5.0 million).
    - All employment figures for the capital and operational phases of the proposed development are estimated based on sectoral employment multipliers as generated by the 2004 Eastern Cape Social Accounting Matrix (SAM) adjusted to 2018 prices.

- **Local tourism industry**
  A review of secondary research, municipal plans and an engagement with the local tourism association, identified no major tourism assets that were likely to be impacted by the proposed wind farm development. Accordingly, the potential impact on the local tourism industry identified in the scoping report was removed.

- **Construction of the wind energy facility**
  Based on similar sized wind farm developments, it is estimated that the maximum construction period will be in the region of 24 months.

- **Operation of the wind energy facility**
  It is assumed that the operational lifespan of the Impofu East Wind Farm will be approximately 20 years, in line with the typical duration of REI4P power purchase agreements. It is further assumed that the developer will not seek to decommission the wind farm after this 20-year

period but rather upgrade the facility in order to prolong its lifespan, should a power purchase agreement for an extended period be in place.

1.3.2 Limitations

- **Site layout**
  The report is based on a project description taken from preliminary design specifications and site layouts for the proposed wind energy facility. The site layout has not yet been finalised and is likely to undergo a number of iterations and refinements before it can be regarded as definitive. All potential turbine array alternatives will, however, be contained within the property boundaries of the study area.

- **Statistical Data**
  The most recently available demographic statics published by StatsSA are from the 2016 Community Survey. These statistics however are only available down to a local municipal level. In order to obtain demographic statistics for smaller administrative boundaries (e.g. wards) which more closely align to the boundaries of the proposed wind energy facility site it would be necessary to utilise 2011 Census figures.

  Given that the 2011 data is dated, and the corresponding Kouga ward boundaries have changed notably between 2011 and 2016, it is felt that the more recent statistics from the 2016 Community Survey should be utilised. In utilising these statistics however, it is acknowledged that some of their descriptive power will be reduced given the size of the administrative area being considered (i.e. Kouga Local Municipality).

- **Interviews with stakeholders**
  Interviews were undertaken in 2018 and 2019 to collect information from key parties that are likely to be interested in and affected by the proposed developments. These interviews were conducted telephonically. These interviews formed the basis of the primary data collection and assisted with the gathering of baseline information as well as establishing the stakeholder's perceptions, interests and concerns. The survey template which was used is attached as an appendix to this report. Were applicable, results were aggregated in order to preserve the confidentiality of the results. As such, responses are not presented per farm/property/ land owner or respondent.

  It is recognised that responses to the survey may be based on subjective opinions that are difficult to quantify. Despite this shortcoming, it was however, still important to gauge the perceptions of identified interested and affected parties as they represent local stakeholder interests.

1.4 Methodology and Approach to Study

Development (DEA&DP) Planning Guidelines for Social Impact Assessment. The Guidelines are based on accepted international best practice guidelines, including the Guidelines and Principles for Social Impact Assessment[2]. This EIA study involved:

[2] Source: INTER-ORGANIZATIONAL COMMITTEE ON GUIDELINES AND PRINCIPLES FOR SOCIAL IMPACT ASSESSMENT, 2003. Principles and guidelines for social impact assessment in the USA. **Impact Assessment and Project Appraisal.** 21,3: 231–250.

- A review of demographic data from the 2016 Community Survey and other available sources
- A review of relevant planning and policy frameworks for the Kouga Local Municipality
- A review of information from similar studies (e.g. Spitskop Wind Energy Facility, Inyanda Roodepoort Wind Farm, Plan-8 Infinite Energy Grahamstown Wind Energy Facility)
- A literature review of socio-economic issues associated with wind energy facilities (e.g. Dent & Sims, 2007; Duponts, 2009; CanWin, 2006; Wasatch Wind, 2011; Hoen et al, 2009; Wolverton & Bottemiller, 2013; EirGrid Plc, 2016)

The identification of potential socio-economic issues associated with the proposed wind energy facility is based on a review of relevant documentation, experience with similar projects, selected engagements, and some familiarity with the study area.

1.5 Report Structure

The report is divided into seven chapters, namely:

- Chapter 1: Introduction
- Chapter 2: Policy and Planning Environment
- Chapter 3: Overview of the Study Area
- Chapter 4: Description of the key socio-economic issues
- Chapter 5: Alternatives
- Chapter 6: Assessment of the Significance of Impacts

Chapter 2 Policy and Planning Environment

The policy and planning environment outlines the key legislation and policies, at both a national, provincial and local level, that are applicable to the proposed wind energy facility development. A review of key planning and policy documents is an integral component of the overall socio-economic impact assessment as it ensures that the proposed development conforms to the relevant spatial principles and guidelines contained in the relevant legislation and planning documents. Failure of the development to comply with these standards means that it would not be supported in its current form.

The following section provides an overview of the most significant policy documents relevant to the proposed Impofu East Wind Farm, namely:

- The White Paper on Renewable Energy (2003)
- The National Energy Act (2008)
- The Integrated Electricity Resource Plan (IRP) 2010 – 2030 (2011)
- National Development Plan (NDP) (2011)
- Eastern Cape Sustainable Energy Strategy (2011)
- Eastern Cape Provincial Economic Strategy (PEDS) (2016)
- Sarah Baartman Integrated Development Plan (IDP) (2017)
- Sarah Baartman Spatial Development Framework (SDF) (2013)
- Kouga IDP (2017)
- Kouga SDF (2015)
- Renewable Energy Independent Power Producer Procurement Programme (REI4P)

2.1 National White Paper on Renewable Energy (2003)

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

The white paper further develops a framework in which a national renewable energy plan can be established and operate. The purpose of such a plan is to ensure that, in line with the Kyoto Protocol to which the country is a signatory, South Africa reduces its greenhouse gas emissions.

In addition to reducing greenhouse gas emissions, the promoting the use of renewable energy sources, is aimed at ensuring energy security through the diversification of supply as articulated in the National Energy Act (34 of 2008).

The long-term goal of the South African government is to create a renewable energy industry, that utilises energy sources that, in the future, will offer a sustainable, non-subsided alternative to fossil fuels.

The 10-year target set out in the White Paper is:

10 000 GWh (0.8 Mtoe) renewable energy contribution to final energy consumption by 2013, to be produced mainly from biomass, wind, solar and small-scale hydro. The renewable energy is to be utilised for power generation and non-electric technologies such as solar water heating and bio-fuels. This is approximately 4% (1 667 MW) of the projected electricity demand for 2013 (41 539 MW).

2.2 National Energy Act (34 of 2008)

The National Energy Act was promulgated in 2008. One of the objectives of the Act was to promote diversity in energy supply and its sources. In this regard the objectives of the Act, as stated in the preamble, makes direct reference to facilitating the "increased generation and consumption of renewable resources".

2.3 Integrated Resource Plan (IRP) 2010 – 2030 (2011)

The 2011 IRP is currently under review and is anticipated to be finalised in 2018. Under the 2011 IRP it is projected that an additional capacity of 56 539 MW will be required to support the country's economic development and ensure adequate reserves over the next 20 years. Under the 2011 assumptions, this required expansion was more than twice the size of the existing capacity of the system.

A significant component of the above-mentioned plan is the expansion of the use of renewable energy sources to reduce carbon emissions involved in generating electricity. Overall, the proposed plan (2011) implies a total generating capacity of 9 200 MW from wind by 2030.

2.4 National Development Plan (NDP) (2011)

The National Development Plan (NDP) was formulated by the National Planning Commission and released in November 2011. The NDP proposes to create 11 million jobs and grow the economy at an average rate of 5.4% per annum by 2030. In respect of renewable energy, the NDP seeks to ensure that half of the new future generation capacity comes from renewable energy sources. It furthermore recognises the importance of the transition to a low carbon economy. As such the NDP suggests the following:

- Supporting carbon budgeting
- Establishing an economy wide price for carbon by 2030 complemented by energy efficiency and demand management interventions
- Setting a target of 5 million solar water heaters by 2030
- Implementing zero emission building standards that promote energy efficacy
- Simplifying regulatory regime to encourage renewable energy, regional hydroelectric initiative and independent power producers (IPPs)

2.5 Eastern Cape Sustainable Energy Strategy (2012)

The Eastern Cape Sustainable Energy Strategy lays out the province's strategic direction in terms of the renewable energy industry. The focus of the strategy is to encourage sustainable, affordable and environmentally friendly energy production by creating an enabling environment for energy production and sustainable technology, skills and industry development. This is to be achieved through several initiatives including:

- An intensive training programme among relevant decision makers with respect to renewable energy project approvals
- The establishment of an implementation task team to provide potential investors with a one-stop-shop for renewable energy information in the province

- Development of a provincial locational perspective of renewable energy
- Lobbying Eskom to expedite and strengthen the transmission capacity of the former Transkei area
- Lobbying the Department of Energy to set out a long-term programme for the procurement of renewable energy generation

Through the pursuit of these initiatives the Eastern Cape Province seeks to become a leading and preferred destination for renewable energy investment in South Africa.

2.6 Eastern Cape Provincial Economic Development Strategy (PEDS) (2017)

The Eastern Cape PEDS seeks to create a clear, long-term vision and strategy for the growth and development of the Eastern Cape by building on the strength and opportunities of the province, while at the same time addressing its weaknesses and threats.

In pursuit of this goal, PEDS identifies six high potential economic sectors that can catalyse growth in the province. These sectors are:

- Agri-industry
- Sustainable energy
- Ocean economy
- Automotive
- Light Manufacturing
- Tourism

With respect to sustainable energy, PEDS notes that it is imperative that the province aligns all its energy opportunities so as to:

- Create the optimal institutional environment for the location of sustainable energy projects in the Eastern Cape
- Harness the maximum possible value chain, localisation and industrialisation opportunities from sustainable energy projects
- Ensure adequate and aligned skills development
- Link innovation, entrepreneurial and small business opportunities to sustainable energy projects
- Link black industrialist opportunities to sustainable energy projects

2.7 Sarah Baartman District SDF (2013)

The Sarah Baartman SDF observes that the district's economy is dependent on the natural resources of the area (tourism and production). As such, spatial planning initiatives need to support the implementation of the district's Socio-Economic and Enterprise Development Strategy (SEEDS) by:

- Implementing effective spatial planning land use management
- Ensuring that the SDP identifies areas for renewable energy production
- Recognizing that game reserves and farming are playing a greater role in the economy
- Undertaking urban regeneration projects
- Identifying where infrastructure upgrading is required.

- Providing the spatial framework for the district's Area Based Plan (ABP)

The Sarah Baartman SDF further notes that the introduction of alternative energy generation infrastructure and the associated land use change will provide both economic opportunities but may also have a negative impact on the ecotourism of the district (in the form of potential changes to the visual and cultural landscapes). This is an important consideration as part of the proposed site falls in an area identified by the SDF as the N2 development corridor.

2.8 Sarah Baartman District IDP (2017)

The Sarah Baartman IDP identifies the green economy (including, but not limited to renewable energy and ecosystem services) as a focal point of economic development in the district, noting that such investments are likely to have significant economic spinoffs for the region. To achieve this, the IDP proposes investing in natural capital so as to create a new generation of green and blue economy jobs rooted in renewable energy.

2.9 Kouga Local Municipality IDP (2017)

The Kouga IDP notes the growing importance of renewable energy and its associated infrastructure to the municipality's economy, particularly wind farms. The Local Economic Development (LED) department within the municipality actively works with operational wind farms on their social economic development projects as well as preparing the youth for careers in this discipline such as facilitating career expo's and exhibitions, and advocacy for bursaries for learners and university students. The department also assists in facilitating training for Small, Medium and Micro-sized Enterprises (SMMEs) in preparation and anticipation of services needed in wind farm developments.

2.10 Kouga Local Municipality SDF (2015)

The Kouga SDF identifies parts of the proposed grid connection route as falling within an intensive agricultural area and within close proximity to the proposed sustainable rural development node of Oyster Bay. This entails retaining the rural character and low density of Oyster Bay and emphasising coastal conservation.

The parts of the proposed grid connection route however, is designated as a potential location for a wind farm and its associated infrastructure in the SDF. The Kouga SDF sets out several principles that applications for renewable energy and wind farm facilities (including their associated infrastructure such as powerlines) in the municipality should be governed by to ensure that such applications are in line with the municipality's Land Use Planning Ordinance.

2.11 Renewable Energy Independent Power Producer Procurement Programme (REI4P)

The Department of Energy's (DoE) Renewable Energy Independent Power Producers Procurement Programme was established at the end of 2010 as one of the South African government's urgent interventions to enhance South Africa's power generation capacity.

The DoE, national Treasury and the Development Bank of Southern Africa established the Independent Power Producers (IPP) Office for the specific purpose of delivering on the IPP procurement objectives. The primary mandate of this office is to secure electricity from renewable (REI4P) and non-renewable

energy sources from the private sector. However, energy policy and supply is not only about technology, but also has a substantial influence on economic growth and socio-economic development. As such the IPP has been designed to go beyond procurement of energy to also contribute to broader national development objectives such as job creation, social upliftment and the broadening of economic ownership.

At a national level the following commitments have been made for bid windows 1, 2, 3, 3.5 and 4 as of June 2018 (SAWEA, 2019):

- 6 422 MW of electricity had been procured from 112 Renewable Energy IPPs in the seven bid rounds;
- 3 052 MW of electricity generation capacity from 56 IPP projects has been connected to the national grid;
- Generated 26 840 GWh of clean energy into the national grid;
- Investment (equity and debt) to the value of R201.8 billion, of which R48.8 billion (24%) is foreign investment, was attracted;
- Created 36 528 job years[3] for South African citizens;
- Socio-economic development contributions of R640.3 million to date, mainly to rural communities;
- Enterprise development contributions of R240.6 million to date;
- Carbon emission reductions of 27.2 million tons of CO^2 has been realised by the programme from inception to date;
- Avoided the use of 32.2 million kilolitres of water.

From an Eastern Cape perspective, the following commitments have been made across the aforementioned bid windows:

- Add 1 509 MW to the national grid from 17 REI4P projects;
- Incur R33.8 billion in project costs increasing the gross domestic product (GDP) of the province;
- Incur R4 489 million in social economic development expenditure;
- Contribute R7 434 million to community trusts established as part of the programme;
- Create 18 137 job years.

2.12 Conclusion

The review of the policy planning environment suggests that utilisation of renewable energy sources in South Africa is considered to be an integral means of reducing the carbon footprint of the country, diversifying the national economy and reducing poverty. Any project contributing to the above-mentioned objectives, such as the Impofu East Wind Farm, can therefore be considered strategically important to South Africa.

From a provincial and municipal policy perspective the facilitation of renewable energy projects and interventions that related to the broader green economy are seen as a priority. The Eastern Cape Provincial Economy Development Strategy makes particular reference to the need to develop the sustainable energy industry which includes renewable energies. Likewise, both the Sarah Baartman district and Kouga local municipalities have noted the importance of wind energy in their IDPs and SDFs and are actively seeking to promote such developments.

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

Chapter 3 Overview of the Study Area

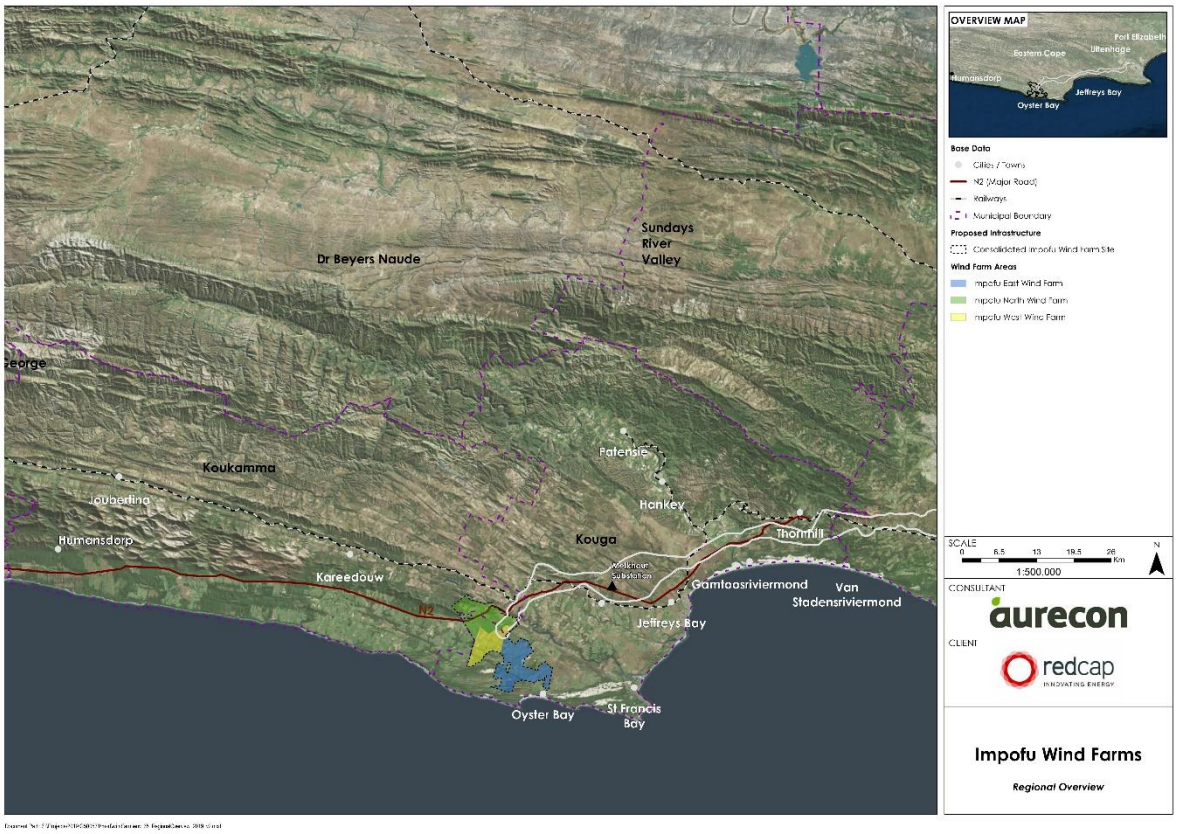
The following section documents various aspects of the study area including: population and household numbers; income levels; and employment. In addition, the section also reviews the economic structure and performance of the study area.

The intention of this review is to provide an overview of the socio-economic context of the area so as to better understand the dynamics of the area.

3.1 Administrative Context for Study Area

The Kouga Local Municipality (EC108) in which the Impofu East Wind Farm is located, is situated on the southern seaboard of the Eastern Cape (see Figure 3.1) and is one of the seven local municipalities within the Sarah Baartman District Municipality (DC10). The municipality includes a coastal zone between the Van Stadens River in the east and the Tsitsikamma River in the west, stretching inland towards the Baviaanskloof Mountains in the north.

Figure 3.1: Major settlements within the Kouga Local Municipality



The Kouga Local Municipality covers an area of roughly 2 670 km^2. This makes it the second smallest municipality in the district, accounting for only 4.5% of the total surface area of the Sarah Baartman District. The municipality is bordered by the Dr Beyers Naudé and Sundays River Valley Local Municipalities to the north, the Nelson Mandela bay Metro to the east, and the Koukamma Local Municipality to the west.

The largest towns within the Kouga Local Municipality are Humansdorp and Jeffreys Bay, while smaller settlements include: Hankey, Patensie and St Francis Bay. The administrative centre of the municipality is Jeffreys Bay which lies approximately 75 km southwest of the Nelson Mandela Bay Metropolitan Area (Port Elizabeth). The urban areas are typical of the spatial patterns of towns throughout South Africa, namely that they are segregated by economic classes and reside in clusters. The municipality is divided into 15 administrative wards.

3.2 Socio-Economic Profile of the Study Area

3.2.1 Population, Income and Employment Profile

Selected demographic information is presented in Table 3.1. The Kouga Local Municipality falls within the Sarah Baartman District Municipality and accounts for 21.4% of the district's population and 22.9% of its households. This makes it the most populous locality within the entire district. Population growth between 2011 and 2016 was 0.9% year-on-year. This compares favourably with the Sarah Baartman District Municipality. A growing population, would likely be indicative of greater economic prosperity in the area.

Table 3.1: Overview of the study areas population and household structure in 2016

Indicator	Sarah Baartman District Municipality	Kouga Local Municipality
Area (km^2)	58 194	2 670
Population	444 735	95 270
Number of Households	122 911	28 173
Population density (km^2)	7.6	35.7
Average household size	3.6	3.4
Population growth rate (2011-2016)	0.4%	0.9%
Average monthly household income (2011, 2016 prices)	R 8 889	R10 598

Source: Quantec Standardised Regional (2016)

The disposable average monthly income of households in the Kouga Local Municipality was R10 598 in 2011 (in current 2016 prices). This was significantly higher than that of the Sarah Baartman District Municipality (R8 889; 2016 prices) during the same period. Despite this high average household income, poverty still remains endemic in the Kouga Local Municipality. According to Stats SA (2016) the poverty headcount[4] within the Kouga Local Municipality (5.7%) was higher than the district average (4.5%) but lower than the provincial figure (12.7%). This is evident by the high proportion of households in the Kouga Local Municipality that earn no income (15.3%) – higher than both the district (12.5%) and provincial (15.2%) values.

Table 3.2: Employment profile of the Sarah Baartman and Kouga municipalities, 2016

Indicator	Sarah Baartman District Municipality	Kouga Local Municipality
Working age population	293 910	62 964
Labour force	185 238	44 043

[4] Stats SA utilised the South African Multidimensional Poverty Index (SAMPI) to measure the extent of poverty in the country. The SAMPI is an index that is constructed using eleven indicators across four dimensions, namely: health, education, living standards and economic activity. Poverty headcount figures were then determined based on the proportion of households that are considered to be "multidimensional poor" in terms of the index.

Labour force participation rate	63.0%	69.9%
Employed	150 081	37 998
Unemployed	35 157	6 045
Unemployment rate (% of labour force)	19.0%	13.7%

Source: Quantec Standardised Regional (2016)

The review of the employment profile of the Kouga Local Municipality indicates that only 13.7% of the labour force within the municipality is classified as unemployed (see Table 3.2). The unemployment rates and labour force participation rates in the Kouga Local Municipality were also notably better than that of the Sarah Baartman District Municipality (with an unemployment rate of 19.0% and labour force participation rate of 63.0%).

The relatively low unemployment rate and high labour force participation relative to the district average further suggests that the Kouga Local Municipality is likely subjected to inward migration due to the actual and perceived employment opportunities available within the local municipality.

3.2.2 Economic Profile

The regional Gross Domestic Product per region (GDP-R) for the Kouga Local Municipality was R5.2 billion in 2016 (constant 2010 prices), which accounts for just over 27.0% of the district economy and 2.4% of the Eastern Cape's GDP. Per capita GDP in the municipality was R55 437 in constant 2010 prices, which was 26.4% higher than in the Sarah Baartman District Municipality and 68.0% higher than in the rest of the Eastern Cape. These figures suggest that, although the Kouga Local Municipality's economy is relatively small in terms of GDP, they perform strongly in terms of economic output.

Table 3.3: GDP-R structure of the Sarah Baartman and Kouga municipalities between 2011 and 2016 in Constant 2010 prices

Sector	Sectoral Share of GDP				Kouga CAGR 2011-2016
	Sarah Baartman District Municipality		Kouga Local Municipality		
	2011	2016	2011	2016	
Primary Sectors	**7.0%**	**6.2%**	**5.8%**	**5.3%**	**0.2%**
Agriculture and hunting	6.9%	6.1%	5.7%	5.2%	0.2%
Mining and quarrying	0.1%	0.1%	0.1%	0.1%	-0.1%
Secondary Sectors	**18.6%**	**19.3%**	**18.9%**	**18.6%**	**1.7%**
Manufacturing	12.0%	12.9%	11.4%	11.5%	2.3%
Electricity, gas and water	1.7%	1.5%	1.4%	1.3%	1.2%
Construction	4.9%	4.9%	6.1%	5.8%	0.7%
Tertiary Sectors	**74.4%**	**74.5%**	**75.3%**	**76.1%**	**2.2%**
Trade	21.4%	21.2%	21.6%	21.3%	1.7%
Transport and communication	6.9%	7.4%	5.4%	5.7%	3.2%
Finance and business services	19.1%	20.1%	26.0%	26.4%	2.3%
General government	19.5%	18.5%	16.1%	16.6%	2.6%
Community services	7.5%	7.2%	6.2%	6.1%	1.6%
Total	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**2.0%**

Source: Quantec Standardised Regional (2016)

Over the last five years, the Compounded Annual Growth Rate (CAGR) of the Kouga Local Municipality was 2.0% which meant that it grew faster than both the district (1.7%) and provincial economies (1.3%). This can be attributed to the size and diversity of the municipality relative to the district and the Eastern Cape.

The growth of Kouga Local Municipality over the last few years was largely due to the strong performance of the secondary and tertiary sectors, particularly the transport, storage and communication sector. As indicated in Table 3.3, the transport, storage and communication sector has grown by a strong 3.2%, making it the best performing sector over the last five years. Other sectors that showed the strong growth rates over the period include general government (2.6%), manufacturing (2.3%) and finance and business services (2.3%).

Table 3.4: GDP-R per sector for the Sarah Baartman and Kouga Municipalities in constant 2010 prices (in R' millions)

Sector	Sarah Baartman District Municipality		Kouga Local Municipality	
	2011	2016	2011	2016
Primary Sectors	**R1 257**	**R1 213**	**R276**	**R279**
Agriculture and hunting	R1 242	R1 199	R273	R276
Mining and quarrying	R15	R14	R3	R3
Secondary Sectors	**R3 326**	**R3 755**	**R904**	**R983**
Manufacturing	R2 155	R2 524	R544	R608
Electricity, gas and water	R296	R284	R67	R71
Construction	R875	R947	R294	R304
Tertiary Sectors	**R13 331**	**R14 532**	**R3 603**	**R4 019**
Trade	R3 833	R4 143	R1 035	R1 126
Transport and communication	R1 241	R1 442	R257	R302
Finance & business services	R3 423	R3 924	R1 242	R1 393
General government	R3 495	R3 616	R770	R874
Community services	R1 339	R1 407	R298	R324
TOTAL GDP	**R17 914**	**R19 500**	**R4 783**	**R5 282**

Source: Quantec Standardised Regional (2016)

The positive growth of the above-mentioned sectors in the Kouga Local Municipality was somewhat offset by the low growth exhibited by the primary sectors specifically the mining and quarry sector. The mining sector, despite being small contributor to the municipality's economy, exhibited a -0.1% year-on-year GDP growth rate between 2011 and 2016. The primary sector has also seen its share of the total municipal economy decline from 5.8% in 2011 to 5.3% by 2016.

As evident by both Table 3.4 and Table 3.5 the agricultural sector, despite featuring a low GDP growth rate, has experienced an increase in both GDP and employment in absolute terms between 2011 and 2016. Over this five-year period the sector added over 2 000 jobs, making it the largest employment creator in the municipality. This growth in employment resulted in the agricultural sector exhibiting an average 6.9% year-on-year growth rate between 2011 and 2016.

Agricultural activities are labour intensive, thus a small decline in the size of the sector would generally lead to greater job losses than, for example in manufacturing or utilities, which tend to be more capital

intensive. The agricultural sector is also frequently one of the largest employers in rural areas and it is for these two reasons that the sector is generally prioritised in development strategies.

Table 3.5: Employment structure of the Sarah Baartman and Kouga Municipalities between 2011 and 2016

Sector	Share of Total Employment				Kouga Absolute Change 2011-2016
	Sarah Baartman District Municipality		Kouga Local Municipality		
	2011	2016	2011	2016	
Primary Sectors	**20.4%**	**23.5%**	**19.3%**	**22.2%**	**2.9%**
Agriculture and hunting	20.4%	23.5%	19.3%	22.2%	2.9%
Mining and quarrying	0.0%	0.0%	0.0%	0.0%	0.0%
Secondary Sectors	**14.4%**	**14.2%**	**16.1%**	**15.3%**	**-0.8%**
Manufacturing	6.5%	5.8%	5.9%	5.1%	-0.8%
Electricity, gas and water	0.3%	0.3%	0.3%	0.3%	0.0%
Construction	7.7%	8.1%	10.0%	9.9%	-0.1%
Tertiary Sectors	**65.1%**	**62.3%**	**64.6%**	**62.5%**	**-2.0%**
Trade	24.5%	23.1%	27.1%	25.9%	-1.2%
Transport and communication	3.5%	3.6%	2.8%	2.9%	0.0%
Finance and business services	8.7%	8.3%	9.4%	8.8%	-0.7%
General government	12.5%	11.1%	10.3%	9.9%	-0.4%
Community services	16.0%	16.2%	14.9%	15.1%	0.2%
TOTAL EMPLOYMENT	**125 532**	**150 081**	**31 286**	**37 998**	**6 712**

Source: Quantec Standardised Regional (2016)

Aside from the agricultural sector, secondary sectors such as utilities and construction also experienced positive employment growth between 2011 and 2016. It is probable that the over 670 jobs created by these two sectors over the period can be attributed to, in part, the construction of several wind farms in the municipality. Tertiary sectors, such as trade and community services, also saw strong employment growth with these two sectors each adding over 1 000 jobs over the period.

The strong growth in agricultural employment over the 2011 to 2016 period, has resulted in a gradual change in employment structure across the municipality. This is evident in Table 3.5 which shows that the tertiary and secondary sectors share of total employment has declined by 2.0% and 0.8% respectively over the review period.

3.3 Local Social and Economic Resources

The proposed site for the wind farms is located exclusively on agricultural land. All except one of the farms on which the proposed wind farm is to be situated are intensive, high production cattle farms (primarily dairy but also some beef) with cultivated pasture and fodder crops, the majority of which are under irrigation, but including non-irrigated “dry land” pastures as well. Some of the dairy farms also include a small percentage of beef cattle production.

While no major tourism attractions are located on the proposed site, the study area is in close proximity to several important tourism attractions including:

- The resort town of Oyster Bay

- Baviaanskloof Wilderness Area
- Tsitsikamma National Park
- Huisklip Nature Reserve

The rural nature of the proposed site means that there are no community facilities (e.g. schools, clinics, etc.). The nearest such facilities are located in Humansdorp and Oyster Bay.

Other than farming enterprises, game farms (such as Jumanji and Thaba Manz) and guest lodges (such as Oyster Bay Lodge), no other businesses were identified in the area based on desktop research.

3.3 Local Social and Economic Issues

In addition to social issues such as unemployment (outlined in Section 3.2), the area in which the wind farm is situated in the Kouga Local Municipality is characterised by poor infrastructure and the absence of needed skills development programmes (Kouga Local Municipality, 2017). Key social and economic priorities in the affected area of the Kouga Local Municipality are addressing illegal dumping; making land available for housing; the maintenance and upgrading of bulk infrastructure; initiating economic and social development projects in the area; and addressing sewer and storm water problems in Oyster Bay (Kouga Local Municipality, 2017).

Chapter 4 Description of Key Socio-Economic Issues

In line with section (1) (vii) of Appendix 2 in the 2014 EIA regulations, the following section provides a description of the socio-economic issues and potential impacts, including cumulative impacts that have been identified for the proposed wind energy facility. A more detail assessment is presented in Chapter6. These potential socio-economic issues are organised under the following headings:

1. Planning and Design Phase
2. Construction Phase
3. Operational Phase
4. Decommissioning Phase

4.1 Planning and Design Phase

The review of key national, provincial and local energy policy documents indicated that the development of energy from renewable sources is strongly supported at all levels.

At a national level the National White Paper on Renewable Energy (2003) notes:

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

The National White Paper on Renewable Energy (2003) goes on to set a national target of 10 000 Gwh renewable energy contribution to final energy consumption in 2013. This is echoed in the 2011 IRP which implies a total generating capacity of 9 200 MW from wind by 2030.

At a local level the Sarah Baartman identifies the promotion and utilisation of renewable energy as a core initiative that influences its policies, objectives, strategies and projects. As such, the proposed wind energy facility could play an important role in the district realising some of its key IDP objectives. The Kouga Local Municipality's IDP likewise identifies renewable energy, particularly wind, as a key drive of local economic development in the area.

Therefore, whilst there are no actual impacts arising during planning and design phase of the project, it is evident that the project aligns with national, provincial and local energy policy and spatial planning objectives.

4.2 Construction Phase

Based on the review process and experience with other wind energy facilities, the potential socio-economic issues that will need to be considered during the construction phase are as follows:

- Temporary stimulation of the national and local economy through construction related spending, and additional spending by SMMEs involved in the construction of the wind energy facility.

- Temporary increase employment in the national and local economies from those employed during the construction of the wind energy facility as well as those employment opportunities created for SMMEs.
- Contribution to skills development in the country and local economy through skills training programmes undertaken by contractors.
- Temporary increase in household earnings from higher construction workers salaries and wages.
- Temporary increase in government revenue through higher personal income tax, VAT, companies tax etc.
- Potential negative changes to the sense of place due to increased visual disturbance to the natural setting that currently characterises the area.
- Potential temporary increase in social conflicts associated with the influx of people.
- Impact on economic and social infrastructure, through the increased movement of heavy equipment on site and the increased use of local social facilities (e.g. clinics) by construction workers.
- Potential impact on actual and perceived property and land values in the immediately affected area.

4.3 Operational Phase

Based on a review process and experience with other wind energy facilities, the potential socio-economic issues that will need to be considered during the operational phase are as follows:

- Sustainable increase in production and GDP nationally and locally through ongoing operational spending (i.e. maintenance) by the wind energy facility.
- Creation of sustainable employment positions nationally and locally. This would occur through the provision of security, staff transport, maintenance either by the wind farm or through the procurement of such services from local SMMEs.
- Skills development of permanently employed workers would potentially improve due to skills programmes undertaken as part of the labour recruitment process.
- Improved standards of living for benefiting household through higher incomes generated by those individuals either employed by the wind farm, or who derive economic benefit from it (i.e. SMMEs providing services to the wind energy facility).
- Sustainable increase in national and local government revenue through higher property taxes and wage payments.
- Provision of electricity for future development.
- Potential local economic and social development benefits derived from through the establishment of a community trust that would undertake community upliftment projects.
- Improvement of the livelihoods of the household's dependant on the local agricultural sector through higher household earnings of both farmers and farm workers.
- Potential negative changes to the sense of place (see construction phase).

4.4 Decommissioning Phase

At the conclusion of the Power Purchase Agreement (PPA) between the owner and Eskom, consideration will be given to the future of the wind energy facility. The facility will either be disassembled, kept as it is or upgraded with newer technology. The approach adopted will be at the discretion of the owner, and subject to the signing of a new PPA between themselves and Eskom.

If the facility is decommissioned, the land will be rehabilitated in order to return it to pre-project conditions. Note however, that roads built as part of the project as well as the wind turbines underground foundations will remain following the decommissioning of the facility. This also means that all impacts whether positive or negative, which take place during the operational phase will cease to exist. At the same time spending on the disassembly of the components and rehabilitation of land will increase the demand for construction services and other industries, thus stimulating economic activity in the local area, albeit over a temporary period.

Socio-economic impacts stimulated during the decommissioning phase are expected to be similar to those that took place during the construction phase. They will also be temporary in nature, but most likely will take a much shorter time than the construction phase

Chapter 5 Alternatives

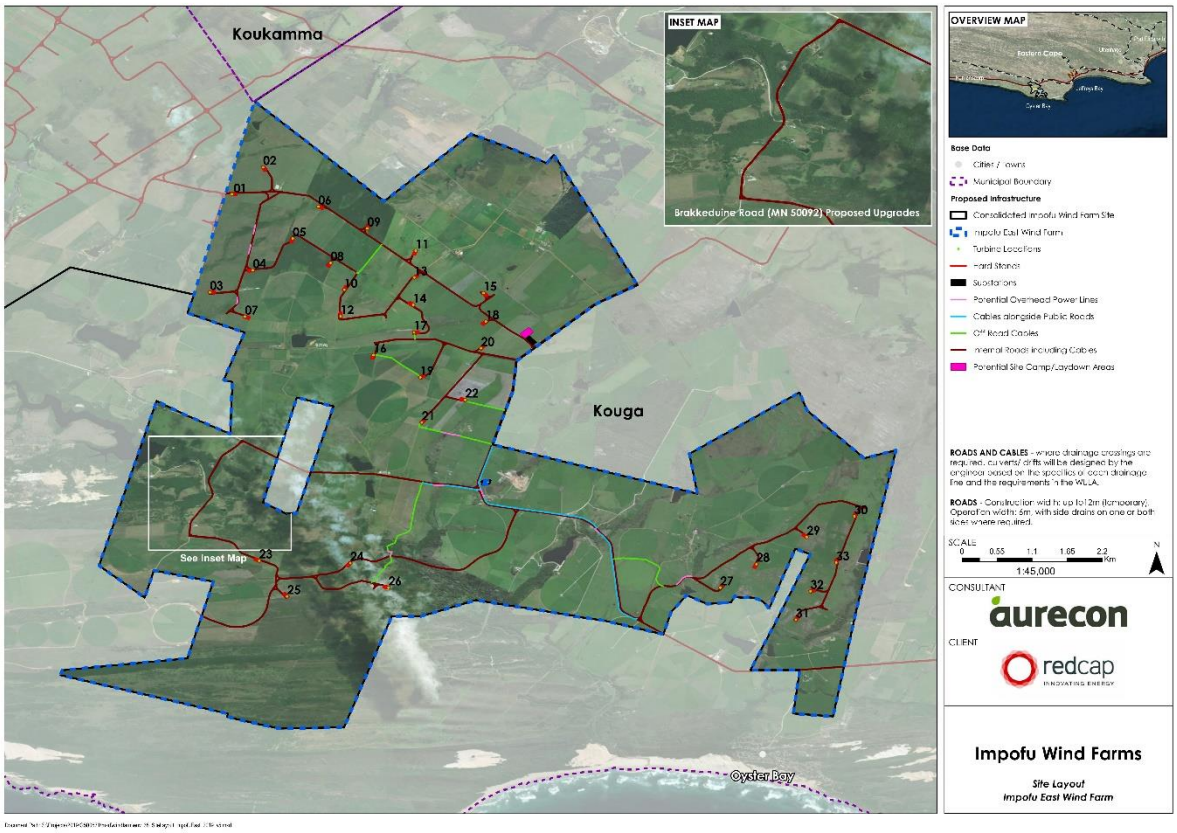
The National Environmental Management Act (107 of 1998) requires the consideration and assessment of feasible and reasonable alternatives in the EIA process. When assessing the various alternatives of the proposed activity (i.e. establishment of a wind energy facility), consideration should be given to the:

- Type of activity to be undertaken;
- Location of the proposed activity
- Design or layout of the activity;
- Technology to be used in the activity; and
- Option of not implementing the activity (no-go alternative).

However, only the No-Go option is assessed in this report; and the site and layouts considered and assessed represent the preferred alternative (refer to Figure 5.1 below).

An environmental and social screening process has been undertaken to ensure all sensitive areas are avoided. Various conceptual layouts for the wind farms have been undertaken to date on the remaining areas, but were not considered feasible from a technical or environmental perspective. Micro-siting of the proposed infrastructure will be required as the project progresses, and will result in a preferred layout that minimises the predicted negative impacts.

Figure 5.1: Proposed turbine and substation layout for Impofu East Wind Farm



Chapter 6 Assessment of the Significance of Impacts

6.1 Methodology

6.1.1 Impact Methodology

In line with the EIA regulations all impacts identified in Chapter 4 were evaluated in terms of a methodology devised by Aurecon to establish the **intensity of the impact** (size or degree scale), the **type** of impact, being either a positive or negative impact; the **duration** (temporal scale); the **extent** (spatial scale), as well as the **probability** (likelihood). Table 6.1 outlines the various categories for each of the aforementioned aspects.

Table 6.1: Categories for various impact aspects

Aspect	Category	Numerical Rating	Description
Intensity	Negligible	1	Natural and/ or social functions and/ or processes are negligibly altered
	Very low	2	Natural and/ or social functions and/ or processes are slightly altered
	Low	3	Natural and/ or social functions and/ or processes are somewhat altered
	Moderate	4	Natural and/ or social functions and/ or processes are moderately altered
	High	5	Natural and/ or social functions and/ or processes are notably altered
	Very High	6	Natural and/ or social functions and/ or processes are majorly altered
	Extremely High	7	Natural and/ or social functions and/ or processes are severely altered
Duration	Immediate	1	Impact will self-remedy immediately
	Brief	2	Impact will not last longer than 1 year
	Short-term	3	Impact will last between 1 and 5 years
	Medium-term	4	Impact will last between 5 and 10 years
	Long-term	5	Impact will last between 10 and 15 years
	On-going	6	Impact will last between 15 and 20 years
	Permanent	7	Impact may be permanent, or in excess of 20 years
Extent	Very Limited	1	Limited to specific isolated parts of the site
	Limited	2	Limited to the site and its immediate surroundings
	Local	3	Extending across the site and to nearby settlements
	Municipal Area	4	Impacts felt at a municipal level
	Regional	5	Impacts felt at a regional / provincial level
	National	6	Impacts felt at a national level
	International	7	Impacts felt at an international level
Probability	Highly Unlikely/ None	1	Expected never to happen

	Rare/ Improbable	2	Conceivable, but only in extreme circumstances, and/or might occur for this project although this has rarely been known to result elsewhere
	Unlikely	3	Has not happened yet but could happen once in the lifetime of the project, therefore there is a possibility that the impact will occur
	Probable	4	Has occurred here or elsewhere and could therefore occur
	Likely	5	The impact may occur
	Almost Certain/ Highly Probable	6	It is most likely that the impact will occur
	Certain/Definite	7	There are sound scientific reasons to expect that the impact will definitely occur

When assessing these impacts, broader considerations were also considered. These include the **confidence** with which the assessment of the impact was undertaken, the **reversibility** of the impact and the resource **irreplaceability**.

For each predicted impact, certain criteria are applied to establish the likely **significance** of the impact, firstly in the case of no mitigation being applied and then with the most effective mitigation measure(s) in place.

Before the significance is determined, it is first necessary to calculate the consequence using the following formula:

Consequence = type x (intensity + duration + extent).

To calculate the significance of an impact, the **probability** (or likelihood) of that impact occurring is applied to the consequence as follows:

Significance = consequence x probability

Depending on the numerical result of this formula, the impact would fall into a significance category (see Table 6.2) as negligible, minor, moderate or major, and the type would be either positive or negative.

Table 6.2: Application of significance ratings

Significance Rating	Score Rage	
Major (-)	-109	-147
Moderate (-)	-73	-108
Minor (-)	-36	-72
Negligible (-)	-1	-35
Neutral	0	
Negligible (+)	1	35
Minor (+)	36	72
Moderate (+)	73	108
Major (+)	109	147

6.1.2 Assessment of Cumulative Impacts

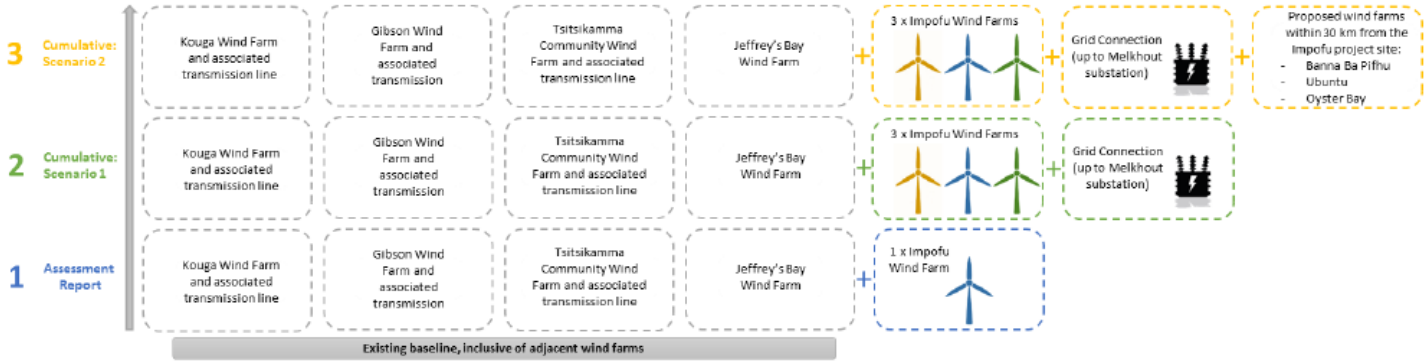
The cumulative impacts of the Impofu East Wind Farm are an important consideration for the project given the context of the existing 'renewable energy landscape'. The assessment of cumulative effects have been considered for all renewable energy developments with a valid Environmental Authorisation within a 30 km radius of the proposed Impofu East Wind Farm site. These wind farms and associated transmission lines are outlined in Table 6.3.

Table 6.3: Adjacent proposed wind farms considered in the assessment of cumulative impacts

Wind Farms	Turbines and MW	Status
Oyster Bay Wind Energy Facility and associated (4.3 km) transmission line	41 (3.6 MW) 140 MW (contracted capacity)	EA; Construction to commence in 2019
Ubuntu Wind Energy Project	31 – 50 (100 MW)	EA
Banna Ba Pifhu Windfarm Project	9 – 17 (30.6 MW)	EA

The cumulative impacts for the project are considered for any renewable energy developments in addition to the assessment taken against the Impofu East Wind Farm. The scenarios for the assessment of cumulative impacts for the project are shown in Figure 6.1.

Figure 6.1: Concept for assessing cumulative impacts



In undertaking the assessment of the cumulative impacts, this socio-economic report considers the findings of the impact studies undertaken for the approved wind farms listed in Table 6.3.

6.1.3 Quantifying Economic Impacts

An economic impact is defined as any exogenous change in the local economy that has either a positive or negative effect on current economic activity in that area. This external change can take the form of new investment such as the construction of a powerline, the upgrading of businesses, the expansion of existing production capacity, etc.

It is important to understand that there are two types of investment when a new project is started. Firstly, there is an initial capital injection/expenditure (CAPEX) which takes the form of either the construction of a new structure or the modification of an existing structure. Secondly, there is an annual recurring

investment to maintain/operate the capital expenditure investment project. This is referred to as operating expenditure or OPEX.

The economic impacts created by a capital injection (CAPEX) are once-off impacts that will occur for the duration of construction. Thus economic impacts associated with the construction phase are not sustainable economic impacts. Operational economic impacts, unlike capital expenditure economic impacts are sustainable and thus are calculated as an annual impact based on operational expenditure (OPEX) for a given year.

The net economic impact of an exogenous change (from CAPEX and/or OPEX) in the economy will be translated according to various direct and indirect economic effects which are defined as follows:

- **Direct effects**: Are those changes in local business activity occurring as a direct consequence of the exogenous change to the economy.
- **Indirect effects**: Include business growth for suppliers to the directly affected businesses and potential growth of municipal revenue due to raised taxes and service levies.
- **Induced effects**: Include business growth as the additional workers (created by direct and indirect economic impacts/effects) spend their income on food, clothing, shelter and other local goods and services.

To quantify the anticipated direct, indirect and induced effect of both a CAPEX and OPEX investment, a number econometric models can be applied. For the purpose of this report the SAM-Leontief model was applied.

A SAM or social accounting matrix is defined as an economy-wide database which contains information about the flow of resources associated with all transactions that take place between economic agents in an economy during a given period. A SAM is an extension of an Input/Output table which shows more detailed information on economic agents and factors of production (i.e. includes households as economic agents). The SAM illustrates in a single square matrix all the interactions between production, income, consumption and capital accumulation in the various sectors of an economy. It is therefore a logical arrangement of statistical information concerning income and expenditure flows in an economy and provides a 'snap shot' of the economy at a given point in time.

The SAM-Leontief model uses social accounting matrices as the underlying database. Coefficients are taken from the SAM and are used to calculate the open (households included) and closed (households excluded) Leontief inverses which are multiplied by the exogenous change to obtain direct, indirect and induced impact on production[5]. The change in production is then multiplied by direct multipliers to obtain specific impacts on GDP, employment and income.

6.2 Impact Evaluation Results

As part of the EIA an impact evaluation was undertaken for both the construction and operational phases of the proposed wind farm. This impact evaluation is based on desktop research, combined with targeted stakeholder engagements and subject to the limitations outlined in Chapter 1. Sections 6.2.1 and 6.2.2 present a summary of both the construction and operational impacts that are anticipated to arise from the proposed wind farm, before and after mitigation. In the unlikely event that

[5] Production/Business Sales refers to the value of all inter- and intra-sectoral business sales generated in the economy as a consequence of the introduction of an exogenous change in the economy. Explained more simply, new business sales equates to additional business turnover as a result of the introduction of an exogenous change in the economy.

decommissioning occurs, the impacts are expected to be similar to those that took place during the construction phase and therefore the same ratings have been applied.

6.2.1 Construction Phase Impacts

The following sections indicate the positive and negative impacts that are likely to occur during the construction phase of the proposed Impofu East wind farm.

6.2.1.1 Positive Impacts during Construction

a) Temporary Stimulation of the national and local economy

As indicated in Table 6.4 it is estimated that the project will increase the country's production by R2 721.5 million in 2018 prices, which will translate into an additional R956.0 million of Gross Domestic Product per Region (GDP-R). These effects will take place over the course of the construction period estimated at 24 months.

Table 6.4: Estimated impact on the national and local economies – CAPEX (R' millions, 2018 prices)

Effect	Impact on Production/Business Sales	Impact on GDP-R
Direct	R1 086.6	R324.2
Indirect	R1 176.7	R458.6
Induced	R458.2	R173.2
Total	**R2 721.5**	**R956.0**

The greatest effects on production and GDP-R stimulated during construction activities will be created through the multiplier effects, specifically through a combination of production and consumption induced effects. Production induced effects are those that result from an increase in the demand for goods and services from those businesses that are likely to provide inputs (i.e. cement, steel, etc.) to the construction company(ies) responsible for building the proposed wind farm. Consumption induced effects are those that arise from increased spending on goods and services by those individuals employed during the construction phase of the development.

It is assumed that the majority of the direct spend will be spent within local economies. It should be noted that actual final figures will depend on the choice of suppliers and contracts as well as their procurement strategies.

Project phase	**Construction**	
Impact	**Temporary stimulation of the national and local economy**	
Description of impact	**Temporary stimulation of the national and local economy through construction related spending, and additional spending by SMMEs involved in the construction of the wind energy facility. This will lead to an increase in GDP at a national, provincial and local level.**	
Mitigatability	Low	Mitigation does not exist; or mitigation will slightly reduce the significance of impacts

Potential mitigation	• The owner should encourage the main contractors to increase the local procurement practices and promote the employment of people from local communities, as far as feasible, to maximise the benefits to the local economies. • The owner should engage with local authorities and business organisations to investigate the possibility of procuring construction materials, goods and products from local suppliers where feasible.			
Assessment	**Without mitigation**		**With mitigation**	
Nature	Positive		Positive	
Duration	Short term	Impact will last between 1 and 5 years	Short term	Impact will last between 1 and 5 years
Extent	National	Impacts felt at a national level	National	Impacts felt at a national level
Intensity	Very high	Natural and/ or social functions and/ or processes are majorly altered	Very high	Natural and/ or social functions and/ or processes are majorly altered
Probability	Almost certain / Highly probable	It is most likely that the impact will occur	Almost certain / Highly probable	It is most likely that the impact will occur
Confidence	High	Substantive supportive data exists to verify the assessment	High	Substantive supportive data exists to verify the assessment
Reversibility	High	The affected environmental will be able to recover from the impact	High	The affected environmental will be able to recover from the impact
Resource irreplaceability	Low	The resource is not damaged irreparably or is not scarce	Low	The resource is not damaged irreparably or is not scarce
Significance	**Moderate - positive**		**Moderate - positive**	
Comment on significance	Benefit is terminated with the end of construction.			
Cumulative impacts	Given the number of operational and potential wind energy facilities in the area, it is highly likely that the demand for goods and services required for the construction of similar facilities would grow. The presence of such wind facilities, both within the local area and the greater Eastern Cape area, has resulted in the establishment of new industries in the country. The further development of wind farms in the area could potentially promote new businesses particularly those that provide supporting services to construction companies.			

b) Temporary increase in employment in the national and local economies

The proposed wind farm is anticipated to directly create approximately 180 Full Time Equivalent (FTE[6]) employment positions over the course of the development (see Table 6.5).

Table 6.5: Estimated Full Time Equivalent positions to be created during construction

Effect	Employment (FTE)
Direct	180
Indirect	1 138
Induced	470
Total	**1 788**

The construction sector in the Kouga Local Municipality employed approximately 3 780 people in 2016 (Quantec, 2016). Given the size of the construction sector within the municipality it is anticipated that there should be sufficient local labour to satisfy the demand for 180 construction workers.

[6] FTE refers to the total number of hours worked by one employee on a full-time basis.

Beyond the direct employment opportunities that will be created by the project during the construction phase the development will also have a positive spin-off effect on the employment situation in other sectors of the national and local economies. Through the procurement of local goods and services (i.e. consumption induced effects) the project will support an additional 1 138 FTE employment position.

Based on these figures, the total contribution of the proposed wind farm development towards employment creation in the broader South African economy is estimated at further 1 608 FTE employment positions. Throughout the construction phase it is recommended that the developer encourage the contractor to fill as many local positions as possible using labour with the Kouga Local Municipality.

Project phase	**Construction**			
Impact	**Temporary increase employment in the national and local economies**			
Description of impact	**Temporary increase employment in the national and local economies from those employed during the construction of the wind energy facility as well as those employment opportunities created for SMMEs.**			
Mitigatability	Low	Mitigation does not exist; or mitigation will slightly reduce the significance of impacts		
Potential mitigation	• Organise local community meetings to advise the local labour force about the project that is planned to be established and the jobs that can potentially be applied for. • Establish a local skills desk (in Humansdorp) to determine the potential skills that could be sourced in the area. • Recruit local labour as far as feasible. • Employment of labour-intensive methods in construction where feasible. • Sub-contract to local construction companies particularly SMME's and BBBEE compliant and women-owned enterprises where possible. • Use local suppliers where feasible and arrange with the local SMME's to provide transport, catering and other services to the construction crews**.**			
Assessment	**Without mitigation**		**With mitigation**	
Nature	Positive		Positive	
Duration	Short term	Impact will last between 1 and 5 years	Short term	Impact will last between 1 and 5 years
Extent	National	Impacts felt at a national level	National	Impacts felt at a national level
Intensity	High	Natural and/ or social functions and/ or processes are notably altered	High	Natural and/ or social functions and/ or processes are notably altered
Probability	Almost certain / Highly probable	It is most likely that the impact will occur	Almost certain / Highly probable	It is most likely that the impact will occur
Confidence	High	Substantive supportive data exists to verify the assessment	High	Substantive supportive data exists to verify the assessment
Reversibility	High	The affected environmental will be able to recover from the impact	High	The affected environmental will be able to recover from the impact
Resource irreplaceability	Low	The resource is not damaged irreparably or is not scarce	Low	The resource is not damaged irreparably or is not scarce
Significance	**Moderate - positive**		**Moderate - positive**	
Comment on significance	Benefit is terminated with the end of construction			
Cumulative impacts	None foreseen given the nature of employment.			

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

The construction of the proposed wind farm is likely to have a positive impact on the skills development in South Africa particularly. During the turbine component assembly and tower manufacturing period which is included as part of the construction phase and is planned to be conducted in the Eastern Cape, it is likely that foreign technical experts will be involved. This will present an opportunity for skills and knowledge transfer between these technical experts and local manufactures.

It is also expected that the construction crew involved in the project will gain knowledge and experience in respect of the development of wind energy facilities. This will be highly beneficial given South Africa's target of generating 9 200 MW from wind energy by 2030 (Department Energy, 2011) as well as the other wind energy developments planned for the Kouga Local Municipality. More skilled local construction crews would most likely also lower the cost of future wind projects in the municipality. In general, most of the unskilled labour and some of the skilled and semi-skilled labour are drawn from local communities, it is therefore highly probable that these workers will be able to utilise these new skills over the long run, in other developments proposed in the Kouga Local Municipality.

In addition to the direct effects of the project on skills development in the country and the local economy, the project could contribute to the development of the local R&D and manufacturing industries associated with wind technology. This could be achieved through partnerships with the Nelson Mandela Metropolitan University (NMMU) in Port Elizabeth. Partnerships of this nature could further enhance the development of new skills and expertise.

Project phase	**Construction**			
Impact	**Contribution to skills development in the country and local economy**			
Description of impact	**Contribution to skills development in the country and local economy through skills training programmes undertaken by contractors.**			
Mitigatability	Low	Mitigation does not exist; or mitigation will slightly reduce the significance of impacts		
Potential mitigation	• Facilitate knowledge and skills transfer between foreign technical experts and South African professionals during the pre-establishment and construction phases. • Set up apprenticeship programmes to build onto existing skill levels or develop new skills amongst construction workers especially those from local communities			
Assessment	**Without mitigation**		**With mitigation**	
Nature	Positive		Positive	
Duration	Permanent	Impact may be permanent, or in excess of 20 years	Permanent	Impact may be permanent, or in excess of 20 years
Extent	National	Impacts felt at a national level	National	Impacts felt at a national level
Intensity	High	Natural and/ or social functions and/ or processes are notably altered	High	Natural and/ or social functions and/ or processes are notably altered
Probability	Probable	The impact has occurred here or elsewhere and could therefore occur	Almost certain / Highly probable	It is most likely that the impact will occur
Confidence	High	Substantive supportive data exists to verify the assessment	High	Substantive supportive data exists to verify the assessment
Reversibility	High	The affected environmental will be able to recover from the impact	High	The affected environmental will be able to recover from the impact

Resource irreplaceability	Low	The resource is not damaged irreparably or is not scarce	Low	The resource is not damaged irreparably or is not scarce
Significance	**Minor - positive**		**Moderate - positive**	
Comment on significance	Benefit will continue to accrue following the end of construction.			
Cumulative impacts	Improved labour productivity and employability of construction workers for similar projects. Possible development of local skills and expertise in R&D and manufacturing industries related to wind technology through partnerships with Nelson Mandela University (NMU) and surrounding Technical and Vocational Education and Training Colleges (TVET). Promotes South Africa's human capital development.			

d) Temporary increase in household earnings

The proposed wind farm will create a total of 1 788 FTE employment positions during construction generating R1 765.8 million of revenue for the affected households in the country through direct, indirect and induced effects depending on route selection. Of this figure R120.7 million will be paid out in the form of salaries and wages to those individuals directly employed during the construction phase. The remaining values of R1 645.1 million in households' earnings will be generated through indirect and induced effects resulting from project expenditure.

Although temporary, this increase in household earnings will have a positive effect on the standard of living within these households. This increase in household income however will varying significantly based on the respective skill levels and job specifications of the employee.

Project phase	**Construction**			
Impact	**Temporary increase in household earnings**			
Description of impact	**Temporary increase in household earnings from higher construction workers salaries and wages**			
Mitigatability	Low	Mitigation does not exist; or mitigation will slightly reduce the significance of impacts		
Potential mitigation	• Recruit local labour as far as feasible to increase the benefits to the local households. • Employ labour intensive methods in construction where feasible. • Sub-contract to local construction companies where possible. • Use local suppliers where feasible and arrange with local SMME's and BBBEE compliant and women-owned enterprises to provide transport, catering and other services to the construction crews.			
Assessment	**Without mitigation**		**With mitigation**	
Nature	Positive		Positive	
Duration	Medium term	Impact will last between 5 and 10 years	Medium term	Impact will last between 5 and 10 years
Extent	National	Impacts felt at a national level	National	Impacts felt at a national level
Intensity	Moderate	Natural and/ or social functions and/ or processes are moderately altered	Moderate	Natural and/ or social functions and/ or processes are moderately altered
Probability	Probable	The impact has occurred here or elsewhere and could therefore occur	Probable	The impact has occurred here or elsewhere and could therefore occur
Confidence	High	Substantive supportive data exists to verify the assessment	High	Substantive supportive data exists to verify the assessment
Reversibility	High	The affected environmental will be able to recover from the impact	High	The affected environmental will be able to recover from the impact

Resource irreplaceability	Low	The resource is not damaged irreparably or is not scarce	Low	The resource is not damaged irreparably or is not scarce
Significance	**Minor - positive**		**Minor - positive**	
Comment on significance	Benefit is terminated with the end of construction			
Cumulative impacts	Improved standard of living of the affected households. Possible increase of households' savings.			

e) Temporary increase in government revenue

The construction of the proposed wind farm will generate revenue for the government during the construction period through a combination of personal income tax, VAT, companies tax, etc. Additional government revenue will also be earned through corporate income tax. Government earnings will be distributed by national government to cover public spending which includes amongst others the provision and maintenance of transport infrastructure, health and education services as well as other public goods.

Project phase	**Construction**			
Impact	**Temporary increase in government revenue**			
Description of impact	**Temporary increase in government revenue through higher personal income tax, VAT, companies tax etc.**			
Mitigatability	Low	Mitigation does not exist; or mitigation will slightly reduce the significance of impacts		
Potential mitigation	• None suggested			
Assessment	**Without mitigation**		**With mitigation**	
Nature	Positive		Positive	
Duration	Short term	Impact will last between 1 and 5 years	Short term	Impact will last between 1 and 5 years
Extent	National	Impacts felt at a national level	National	Impacts felt at a national level
Intensity	Low	Natural and/ or social functions and/ or processes are somewhat altered	Low	Natural and/ or social functions and/ or processes are somewhat altered
Probability	Almost certain / Highly probable	It is most likely that the impact will occur	Almost certain / Highly probable	It is most likely that the impact will occur
Confidence	Medium	Determination is based on common sense and general knowledge	Medium	Determination is based on common sense and general knowledge
Reversibility	High	The affected environmental will be able to recover from the impact	High	The affected environmental will be able to recover from the impact
Resource irreplaceability	Low	The resource is not damaged irreparably or is not scarce	Low	The resource is not damaged irreparably or is not scarce
Significance	**Minor - positive**		**Minor - positive**	
Comment on significance	None			
Cumulative impacts	Lower government debt servicing costs. Increased government revenue for social programmes.			

f) Improvement of the livelihoods of the affected landowners

During the construction of phase of the wind farm development, affected landowners' livelihoods will be improved through option agreements signed between themselves and the wind farm owner. These option agreements will permit for fixed payments to landowners for each turbine cited on their property throughout the construction phase of the development. This will increase the landowners' revenue without materially impacting the existing land use.

Project phase	**Construction**			
Impact	**Improvement of the livelihoods of affected landowners**			
Description of impact	**Income earned by farmers from the turbines on their land could improve the individual revenue streams. This will place them in a better position to further invest in their property. Such additional investment could motivate landowners to expand operations and thus employ additional workers and/or increase their salary/wage bill. These increases would in turn, improve the livelihoods of both workers and landowners.**			
Mitigatability	Low	Mitigation does not exist; or mitigation will slightly reduce the significance of impacts		
Potential mitigation	• None			
Assessment	**Without mitigation**		**With mitigation**	
Nature	Positive		Positive	
Duration	Short term	Impact will last between 1 and 5 years	Short term	Impact will last between 1 and 5 years
Extent	National	Impacts felt at a national level	National	Impacts felt at a national level
Intensity	Moderate	Natural and/ or social functions and/ or processes are moderately altered	Moderate	Natural and/ or social functions and/ or processes are moderately altered
Probability	Probable	The impact has occurred here or elsewhere and could therefore occur	Probable	The impact has occurred here or elsewhere and could therefore occur
Confidence	High	Substantive supportive data exists to verify the assessment	High	Substantive supportive data exists to verify the assessment
Reversibility	High	The affected environmental will be able to recover from the impact	High	The affected environmental will be able to recover from the impact
Resource irreplaceability	Low	The resource is not damaged irreparably or is not scarce	Low	The resource is not damaged irreparably or is not scarce
Significance	**Minor - positive**		**Minor - positive**	
Comment on significance	None			
Cumulative impacts	Same significance as individual impacts.			

g) Impact on property and land value in the immediately affected area

The area surrounding the proposed site for the wind farm is used almost exclusively for farming purposes. The area can therefore be classified as rural. In general, any development associated with some environmental change can influence property values in two ways (Goodwin, 2017):

Firstly, it can reduce the value of the land if the proposed development has a negative image associated with it. This could be related to the real or perceived adverse effects that the proposed development could have on air quality, noise levels, aesthetics, traffic congestion, health, and crime levels in the area. Secondly, the development could increase the demand for surrounding properties and lead to the rise in the area's property values. This could occur in situations where nearby properties are found to carry valuable marketable natural resources (e.g. natural spring, good quality soils).

Given the absence of domestic studies of the impact of wind farms on property prices, international studies are instructive although they reveal conflicting results. This was evident in an American study which examined 24 300 property transactions at ten peri-urban locations over a six-year period there was no evidence that wind turbines within an eight-kilometre radius had a negative impact on property values (Sterzinger, Beck & Kostiuk, 2003). Alternatively, some of the property values rose above the regional average, suggesting that perhaps close proximity to wind turbines (within 10 miles or 16 kilometres) can actually increase residential property values.

Engagements with real estate agents and farmers in the Kouga Local Municipality also support this observation (Stakeholder Interviews, 2019). Although the number of rural property transactions in the area are small, anecdotal evidence from estate agents and rural property owners in the area note that is some instances a premium has been obtained for some properties on which wind farms are planned for development (Stakeholder Interviews, 2019). As noted in other international studies see Hoen, Wiser, Cappers, Thayer and Sethi, 2009; Hinman, 2010) however, it is exceptionally difficult to isolate the "wind farms effect" on the land's property price.

The results from Duponts (2009) study of rural residential properties (known as 'lifestyle properties') were more mixed. A relatively small number of these properties located very close (less than 500 metres) to wind farms were found to have lower than expected sales prices (based on statistical analysis), and it is possible that audio and visual aspects of wind farms contributed to this phenomenon (Duponts, 2009). Property values alongside these locations however also appeared not to have been affected.

Nonetheless, most studies suggest that it is difficult to determine the extent of which wind farms impact property values. But likewise, to date, there is little evidence to support that property values in built-up areas will decline significantly if located in close proximity to a wind farm. Several studies (Dent and Sims, 2007; Hoen, Wiser, Cappers, Thayer and Sethi, 2009) have indicated that there is no conclusive evidence that wind farms will adversely impact property values.

Therefore the literature review, anecdotal evidence from estate agents and the agricultural case study (Lanz, 2019) suggest that, given the rural nature of the area where the wind farm will be developed, property prices will either not be affected, or will experience a slight increase in value due to the additional turbine placement revenue that farms in close proximity to the project area could possibly receive in the future given that the area is seen as being a good area for wind farm development. This is explained in Section 6.2.2 (h) (see also Lanz, 2019).

Project phase	**Construction**	
Impact	**Impact on property and land value in the immediately affected area**	
Description of impact	**Potential impact on actual and perceived property and land values in the immediately affected area**	
Mitigatability	Medium	Mitigation exists and will notably reduce significance of impacts
Potential mitigation	• The mitigation measures proposed by the visual specialists should be adhered to. • Efforts should also be made to avoid disturbing such no=go sites during construction.	

Assessment	Without mitigation		With mitigation	
Nature	Positive		Positive	
Duration	Long term	Impact will last between 10 and 15 years	Long term	Impact will last between 10 and 15 years
Extent	Local	Extending across the site and to nearby settlements	Local	Extending across the site and to nearby settlements
Intensity	Low	Natural and/ or social functions and/ or processes are somewhat altered	Low	Natural and/ or social functions and/ or processes are somewhat altered
Probability	Unlikely	Has not happened yet but could happen once in the lifetime of the project, therefore there is a possibility that the impact will occur	Unlikely	Has not happened yet but could happen once in the lifetime of the project, therefore there is a possibility that the impact will occur
Confidence	High	Substantive supportive data exists to verify the assessment	High	Substantive supportive data exists to verify the assessment
Reversibility	Low	The affected environment will not be able to recover from the impact - permanently modified	Low	The affected environment will not be able to recover from the impact - permanently modified
Resource irreplaceability	Medium	The resource is damaged irreparably but is represented elsewhere	Medium	The resource is damaged irreparably but is represented elsewhere
Significance	**Negligible – positive**		**Negligible - positive**	
Comment on significance	The available evidence is inconclusive of the impact of wind farms on property and land values. Several studies have shown a positive impact, while others have found a negative impact. Given that there are already three operational wind farms in close proximity to the site it is highly likely that any potential negative impact has already occurred.			
Cumulative impacts	None foreseen given the existence of other operational wind farms in the area. Perceptions associated with the effect of industrial type developments on aesthetics and landscape of the natural environment cannot be entirely eliminated, thus some potential buyers might still refrain from buying a property in the area.			

6.2.1.2 Negative Impacts during Construction

a) Changes in the sense of place

A community's 'sense of place' is developed over time as it embraces the surrounding environment, becomes familiar with its physical properties and creates its own history (Lynch, 1981). The sense of place is created through the interaction of a number of different factors such as the areas visual resources, its aesthetics, climate, culture and heritage as well as the lifestyle of individuals that live in and visit the area (Steele, 1981). Most importantly, it is a highly subjective matter and dependent on the demographics of the population that resides in the area and their perceptions regarding trade-offs.

For example, a community living in poverty is generally more likely to be accepting of industrial development that promises employment opportunities while a more affluent residential area is more likely to oppose such a development on the grounds that the development is likely to have an adverse impact on property values.

The area proposed for the development as well as its surrounds does not currently have any large-scale industries or high-rise buildings. **Existing wind farms in close proximity to the new development have a very similar visual footprint** to the proposed new wind farm. Accordingly, most **properties that have a high degree of visual exposure** to the proposed wind farm **already have a**

high degree of visual exposure to the existing wind farms in the area. Given the characteristics of the area, it can be defined as being largely rural. Any rapid changes that significantly alter the characteristics that define the areas sense of place could potentially have a negative impact.

During the construction of the wind farm there are likely to be some minor temporary noise impacts in the more remote areas caused by the movement of vehicles as well as construction activities on site. These impacts are anticipated to occur primarily during the day. The presence of this noise is likely to alter the way the surrounding environment is experienced by households in the area. As construction activities progress and the footprint of the facility grows, the visual impact will also become more apparent and the sense of place experienced by households residing within the visually affected area will be altered further. The Visual Impact Assessment (Lawson and Oberholzer, 2019) found the visual impacts form construction to be moderate negative reduced to minor negative with mitigation.

It is anticipated that households residing on properties within +/- 500 metre radius from the construction of the wind farm will experience the most notable disruption in their sense of place during the construction period. Although it should be noted that no turbines will be constructed within 500 metres of any residence, nor will any construction camps / large laydown areas be located within 500 metres of any residence. Construction noise impacts have been assessed as being of minor negative significance (3E, 2019). These individuals will, over the course of the construction phase of the project, be subjected to either visual or noise disruptions that are currently not present in the area.

The change in sense of place, at the properties located adjacent to, or beyond the site of the proposed wind farm, will also be affected to some extent. The visual exposure on all these properties during the construction phase will not be continuous given the proximity of some of the properties from the wind farm. Nevertheless, the knowledge of the wind farm near the properties and the fact that it could be seen from some parts will still have a negative connotation and will somewhat alter the sense of place experienced by the households residing on these properties.

As stated, the sense of place of local residents is likely to begin to alter once the construction of the proposed wind farm begins. Visual impacts will, however, remain for the entire operation of the development. This means that although the effect on the sense of place could be relatively small considering the population to be affected, the intensity and duration of the impact increases it significantly.

Project phase	**Construction**			
Impact	**Negative changes to the sense of place**			
Description of impact	**Potential negative changes to the sense of place due to increased visual and noise disturbance to the natural setting that currently characterises the area.**			
Mitigatability	Medium	Mitigation exists and will notably reduce significance of impacts		
Potential mitigation	• The mitigation measures proposed by the visual and noise specialists should be adhered to. • Efforts should also be made to avoid disturbing such sites during construction,			
Assessment	**Without mitigation**		**With mitigation**	
Nature	Negative		Negative	
Duration	Short term	Impact will last between 1 and 5 years	Short term	Impact will last between 1 and 5 years
Extent	Limited	Limited to the site and its immediate surroundings	Limited	Limited to the site and its immediate surroundings

Intensity	High	Natural and/ or social functions and/ or processes are notably altered	Moderate	Natural and/ or social functions and/ or processes are moderately altered
Probability	Almost certain / Highly probable	It is most likely that the impact will occur	Almost certain / Highly probable	It is most likely that the impact will occur
Confidence	Medium	Determination is based on common sense and general knowledge	Medium	Determination is based on common sense and general knowledge
Reversibility	High	The affected environmental will be able to recover from the impact	High	The affected environmental will be able to recover from the impact
Resource irreplaceability	Low	The resource is not damaged irreparably or is not scarce	Low	The resource is not damaged irreparably or is not scarce
Significance	**Minor - negative**		**Minor - negative**	
Comment on significance	While reversibility is noted as High, such reversibility can only occur if the site is decommissioned.			
Cumulative impacts	Potential change in perception of the area as "out-of-the-way/peaceful/natural" due to the construction of other wind turbines in the surrounding area albeit temporarily.			

b) Temporary increase in social disruptions associated with the influx of people

Despite the Kouga Local Municipality being sufficiently diversified to supply the required workforce for the construction of the proposed wind farm, it is highly unlikely that this workforce will be drawn exclusively from the surrounding area. Workers involved in the construction of the wind farm will therefore be traveling to the site on a daily basis.

The influx of construction workers into the area could result in social disruptions between the local population, existing construction workers currently operating in the area and this new workforce. These could disrupt existing family structures and social networks through a potential temporary increase in the level of petty crime, illicit activity, alcohol and drugs, unplanned pregnancies and possibly a deterioration of the health of the local community through the spread of communicable diseases (e.g. flu, TB, sexually transmitted diseases (STDs) including HIV and/or AIDS).

Addressing the challenges related to potential social impacts is best done in partnership with all stakeholders in the area, specifically the affected and adjacent property owners, ward councillor and municipality. This would promote transparency, information sharing and help build good relationships between all affected parties.

Project phase	**Construction**	
Impact	**Increase in social disruptions associated with the temporary influx of people**	
Description of impact	**Potential increase in social conflicts associated with the temporary influx of people such as crime, diseases etc.**	
Mitigatability	High	Mitigation exists and will considerably reduce the significance of impacts

Potential mitigation	• Ensure a community liaison office is active in the nearby towns and ensure adherence to strict labour recruitment practices that would reduce the desire of potential job seekers to loiter around the properties in the hope of finding temporary employment. • Control the movement of workers between the site and areas of residence to minimise loitering around the facility. This should be achieved through the provision of scheduled transportation services between the construction site and area of residence. • Employ locals as far as feasible through the creation of a local skills database. • The owner in consultation with the appointed contractor/s should implement an HIV/AIDS/TB awareness programme for all construction workers at the outset of the construction phase. • The contractor/s should develop and implement a code of conduct for behaviours for all workers on site. • Ensure that any damages or losses to nearby affected farms that can be linked to the conduct of construction workers are adequately reimbursed. • Assign a dedicated person to deal with complaints and concerns of affected parties.			
Assessment	**Without mitigation**		**With mitigation**	
Nature	Negative		Negative	
Duration	Short term	Impact will last between 1 and 5 years	Short term	Impact will last between 1 and 5 years
Extent	Local	Extending across the site and to nearby settlements	Local	Extending across the site and to nearby settlements
Intensity	Low	Natural and/ or social functions and/ or processes are somewhat altered	Low	Natural and/ or social functions and/ or processes are somewhat altered
Probability	Almost certain / Highly probable	It is most likely that the impact will occur	Rare / improbable	Conceivable, but only in extreme circumstances, and/or might occur for this project although this has rarely been known to result elsewhere
Confidence	High	Substantive supportive data exists to verify the assessment	High	Substantive supportive data exists to verify the assessment
Reversibility	High	The affected environmental will be able to recover from the impact	High	The affected environmental will be able to recover from the impact
Resource irreplaceability	Low	The resource is not damaged irreparably or is not scarce	Low	The resource is not damaged irreparably or is not scarce
Significance	**Minor - negative**		**Negligible - negative**	
Comment on significance	It is possible that social disruption in the area by construction workers and job seekers could continue to occur after construction if these individuals decide to remain in the area and are unable to find a sustainable income.			
Cumulative impacts	None foreseen			

c) Impact on economic and social infrastructure

The wind farm is anticipated to directly create 180 FTE person years which, given the duration of the project, is anticipated to equate to having a large number of people on site over the course of the project. It is estimated that a notable portion of these construction workers will be coming from outside the local economy and other parts of the Kouga Local Municipality. Given that these migrant workers will require accommodation and other services there is likely to be an increase in the demand for rental accommodation, social services and access to water and electricity.

According to the Kouga Local Municipality's IDP and SDF the municipality has a number of clinics and hospitals situated throughout their municipal area. There are also clinics situated in both Humansdorp and Oyster Bay. Given the proximity of the development site to these settlements it is most likely that these health facilities will experience additional demand for medical services brought about by the influx of works and job seekers.

It is likely that construction workers coming from outside of the area may wish to be accommodated in nearby towns such Humansdorp and Oyster Bay. Rental accommodation in Oyster Bay is scarce, as the town is small. Thus, aside from renting an occasional house, finding accommodation for construction workers and professional engaged in the project in Oyster Bay will be very difficult. Humansdorp in contrast encompasses a much wider variety of accommodation facilities including B&B's and hotels and could potentially serve as a base for workers. Given the size of the development however the demand for accommodation will likely be exceeded by the supply of accommodation (Stakeholder Interview, 2019).

Water and electrical infrastructure in the Kouga Local Municipality is aging and poorly maintained (Kouga Local Municipality 2017) Water for use by the site camp during construction will likely be obtained from the closest viable groundwater and/or surface water sources, to be determined and licensed through a Water User License Application process. Electricity for the site camp is typically provided through access to the closest Eskom off-take point with a backup generator in case of outages. Where no off-take point exists, a generator will be used exclusively. Water and electrical connections during the construction phase will therefore not adversely affect existing municipal infrastructure.

A Traffic Impact Assessment has been undertaken by Schwarz (2019) which has found that the additional volume of traffic generated by the development could impact on the road conditions of the surrounding road network. The paved roads, which service this development are narrow, with overgrown shoulders and are overstressed with significant signs of degradation, including cracking and edge breaks. The unpaved roads are in a poor to very poor condition, resulting from nominal to no maintenance been undertaken. Due to budget constraints it is unlikely that the necessary road maintenance will be undertaken. Therefore Schwarz (2019) has recommended that the developer contribute towards the maintenance of the public roads affected by the development so that the condition would be the same or better post-construction.

Based on the above discussion is expected that the housing and accommodation situation, basic service provision, health facilities and road infrastructure will be under additional strain during the construction period as additional people will be working in the area. These impacts can however be mitigated if the developer engages with the local municipality and plans accordingly.

Project phase	**Construction**	
Impact	**Impact on economic and social infrastructure**	
Description of impact	**Impact on economic and social infrastructure, through the increased demand for accommodation and community facilities (e.g. clinics) by workers and additional traffic on the local road network**	
Mitigatability	High	Mitigation exists and will considerably reduce the significance of impacts
Potential mitigation	• Provide adequate signage along routes to warn the motorists of the construction activities taking place on the site. • Engage with relevant local authorities (and provincial if necessary) and inform them of the development as well as discuss with them their ability to meet the additional demands on social and basic services created by the in migration of workers. • Where feasible, assist the municipality in ensuring that the quality of the local social and economic infrastructure does not deteriorate through the use of social responsibility allocations.	

	• Make contributions to the maintenance of the road network as proposed by the traffic specialist.			
Assessment	**Without mitigation**		**With mitigation**	
Nature	Negative		Negative	
Duration	Short term	Impact will last between 1 and 5 years	Short term	Impact will last between 1 and 5 years
Extent	Municipal area	Impacts felt at a municipal level	Municipal area	Impacts felt at a municipal level
Intensity	Low	Natural and/ or social functions and/ or processes are somewhat altered	Negligible	Natural and/ or social functions and/ or processes are negligibly altered
Probability	Almost certain / Highly probable	It is most likely that the impact will occur	Probable	The impact has occurred here or elsewhere and could therefore occur
Confidence	Medium	Determination is based on common sense and general knowledge	Medium	Determination is based on common sense and general knowledge
Reversibility	High	The affected environmental will be able to recover from the impact	High	The affected environmental will be able to recover from the impact
Resource irreplaceability	Low	The resource is not damaged irreparably or is not scarce	Low	The resource is not damaged irreparably or is not scarce
Significance	**Minor - negative**		**Negligible - negative**	
Comment on significance	None			
Cumulative impacts	Increased pressure on public healthcare facilities Increased wear and tear on road network and other economic infrastructure if contributions are not provided			

6.2.2 Operational Phase Impacts

The following sections indicate the positive and negative impacts that are likely to occur during the operational phase of the proposed wind farm.

6.2.2.1 Positive Impacts during operations

a) Sustainable increase in production and GDP nationally and locally

The total impact on production in the country as a result of the wind farm's operations will equate to R31.0 million in 2018 prices per annum. Aside from the utilities sector, industries that will experience the greatest stimulus from the project will include electrical machinery and apparatus, insurance, and transport service.

Table 6.6: Estimated annual impact on the national and local economies – OPEX (R' millions, 2018 prices)

Effect	Impact on Production/Business Sales	Impact on GDP-R
Direct	R14.2	R7.6
Indirect	R10.6	R3.8
Induced	R6.1	R2.3
Total	**R31.0**	**R13.7**

Due to the annual spending on labour and procurement of local goods and services required to maintain the wind farm, almost all of these new business sales will be generated on an annual basis in the Kouga Local Municipality through the multiplier effects. Only a very small proportion of the annual production resulting from the wind farms operations will be accounted for in other parts of the country.

It is estimated that the project will directly generate R7.6 million of value add per annum. Through indirect and induced effects, an additional R6.1 million of GDP-R will be generated per annum, which means that the total impact of the project on the national GDP-R will equate to R13.7 million per annum in 2018 prices.

Project phase	**Operation**			
Impact	**Sustainable increase in production and GDP nationally and locally**			
Description of impact	**Sustainable increase in production and GDP nationally and locally through ongoing operational spending (i.e. maintenance) by the wind energy facility**			
Mitigatability	Low	Mitigation does not exist; or mitigation will slightly reduce the significance of impacts		
Potential mitigation	• The operator of the wind energy facility should be encouraged to, as far as possible, procure materials, goods and products required for the operation of the facility from local suppliers to increase the positive impact in the local economy.			
Assessment	**Without mitigation**		**With mitigation**	
Nature	Positive		Positive	
Duration	On-going	Impact will last between 15 and 20 years	On-going	Impact will last between 15 and 20 years
Extent	National	Impacts felt at a national level	National	Impacts felt at a national level
Intensity	Moderate	Natural and/ or social functions and/ or processes are moderately altered	Moderate	Natural and/ or social functions and/ or processes are moderately altered
Probability	Almost certain / Highly probable	It is most likely that the impact will occur	Almost certain / Highly probable	It is most likely that the impact will occur
Confidence	High	Substantive supportive data exists to verify the assessment	High	Substantive supportive data exists to verify the assessment
Reversibility	High	The affected environmental will be able to recover from the impact	High	The affected environmental will be able to recover from the impact
Resource irreplaceability	Low	The resource is not damaged irreparably or is not scarce	Low	The resource is not damaged irreparably or is not scarce
Significance	**Moderate – positive**		**Moderate - positive**	
Comment on significance	None			
Cumulative impacts	Sufficient economies of scale could be created to establish new businesses in the local economies. These businesses could then supply the goods and services required for the operation and maintenance of the facility than cannot currently be procured in the area. This would contribute to the local economies' growth and development.			

b) Creation of sustainable employment positions nationally and locally

The ongoing maintenance and monitoring of the wind farm will directly create an estimated 20 FTE employment position all of which will be retained for the lifespan of the wind farm. Aside from the direct employment opportunities, the wind farm will support a further estimated 52 FTE employment positions

created through the production and consumption induced effects. Due to the spatial allocation of procurement spending and direct employment created, most of the indirect and induced positions will also be created outside of the local area.

Project phase	**Operation**			
Impact	**Creation of sustainable employment positions nationally and locally**			
Description of impact	**Creation of sustainable employment positions nationally and locally. This would occur through the provision of security, staff transport, maintenance either by the wind farm or through the procurement of such services from local SMMEs.**			
Mitigatability	Low	Mitigation does not exist; or mitigation will slightly reduce the significance of impacts		
Potential mitigation	• Where possible, local labour should be considered for employment so as to increase the positive impact on the local economy • As far as possible, local SMMEs should be approached to investigate the opportunities for supply inputs required for the maintenance and operation of the facility.			
Assessment	**Without mitigation**		**With mitigation**	
Nature	Positive		Positive	
Duration	On-going	Impact will last between 15 and 20 years	On-going	Impact will last between 15 and 20 years
Extent	National	Impacts felt at a national level	National	Impacts felt at a national level
Intensity	Moderate	Natural and/ or social functions and/ or processes are moderately altered	Moderate	Natural and/ or social functions and/ or processes are moderately altered
Probability	Almost certain / Highly probable	It is most likely that the impact will occur	Almost certain / Highly probable	It is most likely that the impact will occur
Confidence	High	Substantive supportive data exists to verify the assessment	High	Substantive supportive data exists to verify the assessment
Reversibility	High	The affected environmental will be able to recover from the impact	High	The affected environmental will be able to recover from the impact
Resource irreplaceability	Low	The resource is not damaged irreparably or is not scarce	Low	The resource is not damaged irreparably or is not scarce
Significance	**Moderate - positive**		**Moderate - positive**	
Comment on significance	None			
Cumulative impacts	Larger number of permanent operational positions created Improved living standards of the directly and indirectly affected households			

c) Skills development of permanently employed workers

South Africa has a limited number of large-scale wind energy facilities and the industry is still in its infancy, thus the skills base to operate and maintain such facilities is not always readily available. It is likely that highly skilled personnel would need to be recruited from outside of the Kouga Local Municipality. These employees would include skilled “mechatronics” engineers (specialised in both electrical and mechanical engineering) likely to be recruited from the NMBM and trained by the manufacturer, as well as less skilled services such as safety and security and mechatronic assistants. Maintenance will be carried out throughout the lifetime of the turbines. A maintenance schedule usually involves an initial inspection after commissioning, semi-annual inspection, an annual inspection and

two- and five-year inspections but this varies according to the turbine (Tarbish, 2010). Typical activities during maintenance include changing of oil, replacement of brake lining and cleaning of components.

Project phase	Operation			
Impact	**Skills development of permanently employed workers**			
Description of impact	**Skills development of permanently employed workers would occur due to skills programmes undertaken as part of the labour recruitment process.**			
Mitigatability	Low	Mitigation does not exist; or mitigation will slightly reduce the significance of impacts		
Potential mitigation	• The wind farm owner should consider establishing vocational training programmes and/or bursary schemes for the local labour force to promote the development of skills required by the wind energy facility. This would initially permit people to be employed by the development and, in the future, at other similar facilities elsewhere.			
Assessment	**Without mitigation**		**With mitigation**	
Nature	Positive		Positive	
Duration	Permanent	Impact may be permanent, or in excess of 20 years	Permanent	Impact may be permanent, or in excess of 20 years
Extent	Municipal area	Impacts felt at a municipal level	Municipal area	Impacts felt at a municipal level
Intensity	Moderate	Natural and/ or social functions and/ or processes are moderately altered	Moderate	Natural and/ or social functions and/ or processes are moderately altered
Probability	Almost certain / Highly probable	It is most likely that the impact will occur	Certain / definite	There are sound scientific reasons to expect that the impact will definitely occur
Confidence	High	Substantive supportive data exists to verify the assessment	High	Substantive supportive data exists to verify the assessment
Reversibility	High	The affected environmental will be able to recover from the impact	High	The affected environmental will be able to recover from the impact
Resource irreplaceability	Low	The resource is not damaged irreparably or is not scarce	Low	The resource is not damaged irreparably or is not scarce
Significance	**Moderate - positive**		**Moderate - positive**	
Comment on significance	None.			
Cumulative impacts	Development of new skills and expertise in the area to support the development of the wind energy industry. Human capital development of the affected workers. Experience in operating and maintaining a wind energy facility.			

d) Improved standards of living for benefiting household

The creation of 72 FTE employment positions throughout the country will generate an estimated R22.5 million of additional personal income (2018 prices), which will be sustained for the entire duration of the wind farm's lifespan. Given the average household size in affected local municipality and nationally, this increase in household earnings will support up to 254 additional people across the country. The sustainable income generated as a result of the project's operation will positively affect the standard of living of all benefitting households.

Project phase	Operation
Impact	**Improved standards of living for benefiting households**

Description of impact	**Improved standards of living for benefiting households through higher incomes generated by those individuals either employed by the wind farm, or who derive economic benefit from it (i.e. SMMES providing services to the wind farm).**			
Mitigatability	Low	Mitigation does not exist; or mitigation will slightly reduce the significance of impacts		
Potential mitigation	• Where possible, the local labour supply should be considered for employment opportunities to increase the positive impact on the area's economy. • As far as feasible, local small and medium enterprises should be approached to investigate the opportunities for supply inputs required for the maintenance and operation of the facility.			
Assessment	**Without mitigation**		**With mitigation**	
Nature	Positive		Positive	
Duration	On-going	Impact will last between 15 and 20 years	On-going	Impact will last between 15 and 20 years
Extent	National	Impacts felt at a national level	National	Impacts felt at a national level
Intensity	Moderate	Natural and/ or social functions and/ or processes are moderately altered	Moderate	Natural and/ or social functions and/ or processes are moderately altered
Probability	Probable	The impact has occurred here or elsewhere and could therefore occur	Probable	The impact has occurred here or elsewhere and could therefore occur
Confidence	Medium	Determination is based on common sense and general knowledge	Medium	Determination is based on common sense and general knowledge
Reversibility	High	The affected environmental will be able to recover from the impact	High	The affected environmental will be able to recover from the impact
Resource irreplaceability	Low	The resource is not damaged irreparably or is not scarce	Low	The resource is not damaged irreparably or is not scarce
Significance	**Minor - positive**		**Minor - positive**	
Comment on significance	None			
Cumulative impacts	Additional households benefiting from increased income due to working on multiple projects Improved health and living conditions of the affected households.			

e) Sustainable increase in national and local government revenue

The proposed wind farm will, through salaries and wages payments, contribute towards both local and national government revenue. This will occur at a national level with the revenue derived from the payment of salaries and wages to permanent employees involved with the maintenance of the wind farm will contribute to the national fiscus. Although it is impossible to trace exactly how such revenue is allocated, any additional revenue generated means that national governments can increase its spending on public goods and services.

Project phase	**Operation**	
Impact	**Sustainable increase in national and local government revenue**	
Description of impact	**Sustainable increase in national and local government revenue through higher property taxes and wage payments**	
Mitigatability	Low	Mitigation does not exist; or mitigation will slightly reduce the significance of impacts
Potential mitigation	• None suggested	

Assessment	Without mitigation		With mitigation	
Nature	Positive		Positive	
Duration	On-going	Impact will last between 15 and 20 years	On-going	Impact will last between 15 and 20 years
Extent	National	Impacts felt at a national level	National	Impacts felt at a national level
Intensity	Low	Natural and/ or social functions and/ or processes are somewhat altered	Low	Natural and/ or social functions and/ or processes are somewhat altered
Probability	Almost certain / Highly probable	It is most likely that the impact will occur	Almost certain / Highly probable	It is most likely that the impact will occur
Confidence	Medium	Determination is based on common sense and general knowledge	Medium	Determination is based on common sense and general knowledge
Reversibility	High	The affected environmental will be able to recover from the impact	High	The affected environmental will be able to recover from the impact
Resource irreplaceability	Low	The resource is not damaged irreparably or is not scarce	Low	The resource is not damaged irreparably or is not scarce
Significance	**Moderate - positive**		**Moderate - positive**	
Comment on significance	None			
Cumulative impacts	Higher government revenue. Increased social expenditure from additional revenue generated from wind farms. Possible improved service delivery due to higher government revenue.			

f) Provision of electricity for future development

The increasing of the electricity supply will benefit both residents and businesses owners across South Africa including in the Kouga Local Municipality. The associated infrastructure linked to the wind farm will also enhance the reliability of the current supply, and could permit residences and businesses to have additional access to electricity. The wind farm coupled with its associated infrastructure will help to unlock further development in South Africa and to a lesser extent in the Kouga Local Municipality.

Project phase	Operation			
Impact	**Provision of electricity for future development**			
Description of impact	**Increasing the energy supply will benefit both residents and business owners, in that the reliability of the current supply will be increased and residences and businesses who do not currently have access to electricity may obtain access**			
Mitigatability	Low	Mitigation does not exist; or mitigation will slightly reduce the significance of impacts		
Potential mitigation	• None suggested			
Assessment	**Without mitigation**		**With mitigation**	
Nature	Positive		Positive	
Duration	On-going	Impact will last between 15 and 20 years	On-going	Impact will last between 15 and 20 years
Extent	National	Impacts felt at a national level	National	Impacts felt at a national level
Intensity	Moderate	Natural and/ or social functions and/ or processes are moderately altered	Moderate	Natural and/ or social functions and/ or processes are moderately altered

Probability	Almost certain / Highly probable	It is most likely that the impact will occur	Almost certain / Highly probable	It is most likely that the impact will occur
Confidence	High	Substantive supportive data exists to verify the assessment	High	Substantive supportive data exists to verify the assessment
Reversibility	High	The affected environmental will be able to recover from the impact	High	The affected environmental will be able to recover from the impact
Resource irreplaceability	Low	The resource is not damaged irreparably or is not scarce	Low	The resource is not damaged irreparably or is not scarce
Significance	**Moderate - positive**		**Moderate - positive**	
Comment on significance	None			
Cumulative impacts	Increase volume and certainty of the energy supply.			

g) Local economic and social development benefits derived from the project's operations

The proposed wind farm will make a notable contribution to economic and social and community development in the area. Communities living close to the project (typically within a 50 km radius of the wind farm) will benefit from the existence of the project over the 20-year life span as Government requires these projects to engage with the social and economic needs of these local communities. The policy requires that the project must invest a percentage of its total project revenue into socio-economic development initiatives and enterprise development programmes identified within the project's sphere of influence. The REI4P to date has had very strict requirements for a percentage of revenue to be invested by the wind farms in these communities and this is checked through quarterly audits by the Department of Energy to ensure this is achieved. For example, the Kouga Wind Farm has spent over R12 million so far within the local communities from 2015 to 2018 and it will be spending around R800 million in the local communities around it in its 20-year life span which will have a significant positive impact. Other examples of initiatives funded by the wind farms in the area are off-road vehicles for the St Francis Hospice, a rebuild of a fire-devastated crèche in Humansdorp, a computer laboratory with 25 solar-powered computers for a local primary school, and a R4 million library requested by a local community (which also created jobs for 18 locals during construction). Furthermore, the wind farms have funded emerging farmers such as the Kruisfontein Emerging Cattle Farmers Cooperative and the Sarah Baartman Honey Bee Trust (SBHBT), helped in the funding of mobile clinics and BBEEE business-skills training enterprises, funded the training of Early Childhood Development (ECD) Practitioner in the area, etc. They also rolled out a series of workshops for woman in the communities on finances, health and nutrition, exercise, personal development and parenting as well as other interventions in the local communities along with scholarship/ internship programmes.

Project phase	**Operation**	
Impact	**Local economic and social development benefits derived from the project's operations**	
Description of impact	**Potential local economic and social development benefits derived from project revenue that would undertake community upliftment projects**	
Mitigatability	Low	Mitigation does not exist; or mitigation will slightly reduce the significance of impacts

Potential mitigation	• Enterprise Development and Socio-economic Development initiatives outlined in the REI4P bid must be effectively implemented. • These plans should be reviewed on an annual basis and, where necessary, updated. • When identifying enterprise development initiatives, the focus should be on creating sustainable and self-sufficient enterprises. • In devising the programmes to be implemented through these allocations, the developer should take into account the local IDPs.			
Assessment	**Without mitigation**		**With mitigation**	
Nature	Positive		Positive	
Duration	On-going	Impact will last between 15 and 20 years	On-going	Impact will last between 15 and 20 years
Extent	Municipal area	Impacts felt at a municipal level	Municipal area	Impacts felt at a municipal level
Intensity	High	Natural and/ or social functions and/ or processes are notably altered	High	Natural and/ or social functions and/ or processes are notably altered
Probability	Almost certain / Highly probable	It is most likely that the impact will occur	Certain / definite	There are sound scientific reasons to expect that the impact will definitely occur
Confidence	High	Substantive supportive data exists to verify the assessment	High	Substantive supportive data exists to verify the assessment
Reversibility	High	The affected environmental will be able to recover from the impact	High	The affected environmental will be able to recover from the impact
Resource irreplaceability	Low	The resource is not damaged irreparably or is not scarce	Low	The resource is not damaged irreparably or is not scarce
Significance	**Moderate - positive**		**Moderate - positive**	
Comment on significance	None.			
Cumulative impacts	Declining levels of poverty in the Kouga Local Municipality. Improved standards of living of the members of the households that benefit from the SED and ED initiatives implemented by the wind farm. Possible improvements in access to services and status of local infrastructure.			

h) Improvement of the livelihoods of the household's dependant on the local agricultural sector

Local farmers would benefit from the presence of wind farms on their land. Wind energy companies generally provide an annual fee for the use of the land (CanWEA, 2006; Wasatch Wind, 2011) and since only a small percentage of the land is used for wind turbines existing land use farming) can continue. This thereby increases the landowners' revenue without materially impacting the existing land use. To ensure this complementary land use is effectively implemented in this development, Red Cap engaged extensively with the project landowners and obtained their inputs into the roads layout, turbine positions, hardstand orientation and substation sites (where applicable).

The anticipated revenue scheme for the Impofu East Wind Farm would be in line with the above trend. Red Cap would has entered into confidential option-to-lease agreements between themselves and the landowners, whereby the landowners would receive an annual fee should the project proceed. This agreement allows for the option-to-lease agreements to be transferred into a full lease agreement whereby the wind farm owner will pay the landowner a fixed proportion of the revenue from the sale of the electricity generated by the wind turbines situated on their land.

The positive impact of this additional revenue is borne out in a case study of the Impact of Wind Farms on Agricultural Resources and Production in the Humansdorp area (Lanz, 2018). Results from the study show that farming was not discontinued on any of the analysed farming operations on which wind farm infrastructure was established. For example, the financial security provided by the wind farms, has enabled one land owner to take up full time farming of his land, where he previously had to be employed in town.

Project phase	**Operation**			
Impact	**Improvement of the livelihoods of the household's dependant on the local agricultural sector**			
Description of impact	**Income earned by farmers from the turbines on their land could improve the individual farmers revenue streams. This will place them in a better position to further invest in their farms. Such additional investment could motivate farmers to expand operations and thus employ additional workers and/or increase their salary/wage bill. These increases would in turn, improve the livelihoods of both farm workers and farmers.**			
Mitigatability	Low	Mitigation does not exist; or mitigation will slightly reduce the significance of impacts		
Potential mitigation	• None			
Assessment	**Without mitigation**		**With mitigation**	
Nature	Positive		Positive	
Duration	On-going	Impact will last between 15 and 20 years	On-going	Impact will last between 15 and 20 years
Extent	Local	Extending across the site and to nearby settlements	Local	Extending across the site and to nearby settlements
Intensity	High	Natural and/ or social functions and/ or processes are notably altered	High	Natural and/ or social functions and/ or processes are notably altered
Probability	Almost certain / Highly probable	It is most likely that the impact will occur	Almost certain / Highly probable	It is most likely that the impact will occur
Confidence	Medium	Determination is based on common sense and general knowledge	Medium	Determination is based on common sense and general knowledge
Reversibility	Low	The affected environment will not be able to recover from the impact - permanently modified	Low	The affected environment will not be able to recover from the impact - permanently modified
Resource irreplaceability	Low	The resource is not damaged irreparably or is not scarce	Low	The resource is not damaged irreparably or is not scarce
Significance	**Moderate - positive**		**Moderate - positive**	
Comment on significance	None			
Cumulative impacts	Same significance as individual impacts			

6.2.2.2 Negative Impacts during operations

a) Negative changes in the sense of place

The effects on the community's sense of place will initially be felt during the construction period and will continue into the operational phase. The assessment of the negative change in the sense of place provided for the construction phase will be almost identical to that of the operational phase.

Project phase	Operation			
Impact	**Negative changes to the sense of place**			
Description of impact	**Potential negative changes to the sense of place due to increased visual and noise disturbance to the natural setting that currently characterises the area.**			
Mitigatability	Medium	Mitigation exists and will notably reduce significance of impacts		
Potential mitigation	• The mitigation measures proposed by the visual and noise specialists should be adhered to. • Efforts should also be made to avoid disturbing such sites during operations.			
Assessment	**Without mitigation**		**With mitigation**	
Nature	Negative		Negative	
Duration	On-going	Impact will last between 15 and 20 years	On-going	Impact will last between 15 and 20 years
Extent	Local	Extending across the site and to nearby settlements	Local	Extending across the site and to nearby settlements
Intensity	Negligible	Natural and/ or social functions and/ or processes are negligibly altered	Negligible	Natural and/ or social functions and/ or processes are negligibly altered
Probability	Unlikely	Has not happened yet but could happen once in the lifetime of the project, therefore there is a possibility that the impact will occur	Rare / improbable	Conceivable, but only in extreme circumstances, and/or might occur for this project although this has rarely been known to result elsewhere
Confidence	High	Substantive supportive data exists to verify the assessment	High	Substantive supportive data exists to verify the assessment
Reversibility	Medium	The affected environment will only recover from the impact with significant intervention	Medium	The affected environment will only recover from the impact with significant intervention
Resource irreplaceability	Low	The resource is not damaged irreparably or is not scarce	Low	The resource is not damaged irreparably or is not scarce
Significance	Negligible - negative		Negligible - negative	
Comment on significance	While reversibility is noted as High, such reversibility can only occur if the site is decommissioned.			
Cumulative impacts	Potential change in perception of the area as “out-of-the-way/peaceful/natural” due to the construction of other wind turbines in the surrounding area albeit temporarily.			

6.2.3 Decommissioning Phase Impacts

It is highly unlikely that once the wind farm is established it will be decommissioned. If the wind farm were to be decommissioned, the land will be rehabilitated in order to return it to pre-project conditions as far as possible. This means that all impacts whether positive or negative, which take place during the operational phase will cease to exist. At the same time spending on the disassembly of the components and rehabilitation of land will increase the demand for construction services and other industries, thus stimulating economic activity in the local area, albeit over a temporary period.

Socio-economic impacts stimulated during the decommissioning phase are expected to be similar to those that took place during the construction phase. They will also be temporary in nature, but most likely will take a much shorter time than the construction phase.

The construction impacts assessed in Section 6.2.1 and listed as follows are also applicable to decommissioning. The same impact ratings can be applied to represent a worst-case scenario:

- Temporary stimulation of the national and local economy;
- Temporary increase of new employment opportunities in the national and local economies;
- Temporary increase in household earnings;
- Temporary increase in social disruptions associated with the influx of people;
- Impact on economic and social infrastructure;

6.2.4 Net effect and trade-off analysis

The assessment of the wind farm, or its net effect from a socio-economic perspective, indicates that the project would generate greater socio-economic benefits during both the construction and operational phases than the potential losses that could occur as a result of its establishment. Stimulation of production, employment, government revenue, skills development and household income as a result of the investment in the project and its subsequent operations will outweigh possible production, employment and household income losses that could potentially be experienced by local businesses affected by changes in the areas aesthetic and visual resources. Adherence to the proposed mitigation measures however would ensure that the offset of impacts is more balanced and that it also takes into account communities and businesses that will be negatively affected.

The positive effects generated by the project will not entirely offset all the negative impacts. This includes the impact on the sense of place that could occur during both construction and operation. These impacts though will affect local communities either temporarily or over the long term. These impacts are not highly significant and can be traded off for the net positive impact created by the project in terms of production, employment, government revenue, community benefits and households' earnings. This means that when compared with the no-go option, the proposed project is associated with greater socio-economic benefits.

Table 6.5: Summary of the net effect on the socio-economic environment

During Construction		During Operations	
Net effect on production	Positive	Net effect on production	Positive
Net effect on employment	Positive	Net effect on employment	Positive
Net effect on household income	Positive	Net effect on household income	Positive
Net effect of government revenue	Positive	Net effect of government revenue	Positive
Net effect on sense of place	Negative	Net effect on sense of place	Negative

6.3 Assessment of the No-Go Option

Under the No-Go option the proposed wind farm would not be developed. As such, all the proposed impacts outlined in Section 6.2 would be "neutral" i.e. should the development not occur none of the negative or positive impacts identified during the construction, operational and decommissioning phases would arise.

6.4 Cumulative Impacts

As outlined in Section 6.2 the net effect of the proposed development from a socio-economic perspective during both the construction and operational phases would be positive (e.g. higher GDP, increase employment, greater government revenue etc). Under both Scenario 1 and Scenario 2 the same type of impacts identified in Section 6.2 will arise.

Accordingly, the cumulative impact, under both Scenario 1 and Scenario 2 would also be positive. The significance of the positive impact however would differ between Scenario 1 and Scenario 2. This is due to the scale of the investment during both the construction and operational phases of Scenario's 1 and 2 differing.

Under Scenario 1, the significance of the net positive socio-economic impact would exceed that of the Impofu East Wind Farm, but would be lower than that of Scenario 2. The significance of the net positive socio-economic impact under Scenario 2 would exceed that of both the Impofu East Wind Farm and Scenario 1. Under both scenario the nature of the impact would remain positive. The cumulative impacts identified are:

- **Cumulative impact on the national and local economy during the construction and operational phases**
  Cumulative impacts on the national and local economy are the same as the construction and operational phase impacts except that that the size of the impact will be greater. That is, since the additional developments will necessitate greater CAPEX and OPEX investment which will in turn increase the effect on production and GDP. Using the SAM (see Section 6.1.3), it is estimated that for every additional R1 million investment in the developments outlined in Section 6.1.2, production will increase by R2.5 million and GDP by approximately R880 000. With mitigation, the impact significance is likely to be **moderate - positive**. Without mitigation, the impact significance is likely to be **moderate - positive**.

- **Cumulative impact on employment in the national and local economies during the construction and operational phases**
  Cumulative impacts on employment are the same as the construction and operational phase impacts except that the size of the impact will greater. As in the case of GDP and production, higher CPAEX and OPEX due to the additional developments will increase employment both during construction (temporarily) and operations (permanent). The SAM suggests that for every additional R10 million investment in these developments, employment will increase by approximately 26 FTEs. With mitigation, the impact's significance is likely to be **moderate - positive**. Without mitigation, the impact significance is likely to be **moderate - positive**.

- **Cumulative impact on household earnings during construction and operational phases**
  Cumulative impacts on household earnings are the same as those that would arise during the construction and operational phases. Again however, the size of the impact will be greater due to increased investment by the other developments. With mitigation, the impact's significance is likely to be **minor - positive**. Without mitigation, the impact significance is likely to be **minor - positive**.

- **Cumulative impact of the increase in government revenue during the construction and operational phases**

Government revenue is anticipated to increase (through higher taxes) during the construction and operational phases of the planned developments outlined in Section 6.1.2. These cumulative impacts will be similar to those of the proposed wind farm, although greater in size. The impact's significance is assessed as being minor – positive. The implementation of mitigation measures will increase the significance marginally, however it's overall significance will remain **minor – positive**. Without mitigation, the impact significance is likely to be **minor - positive**.

- **Cumulative impact on the sense of place**
  The sense of place will be impacted through the presence of various built structures (the proposed wind farms). Because the area is surrounded by several renewable energy facilities and proposed powerlines, the impact significance is assessed as being **moderate** - **negative** without the implementation of mitigation measures. The proposed wind farm would make a fairly small contribution to the overall visual impact to the landscape given the existence of other wind farms in the area. Because the wind farms would likely be seen against a backdrop of other similar structures, the cumulative impact significance is considered to remain **moderate - negative** after mitigation

- **Cumulative impact of an increase in social issues associated with the influx of people**
  Cumulative impacts on social issues the same as those that would arise during the construction phase except that they may occur over a larger area and effect a greater number of people. As noted in the individual impacts however, many of these social issues can be effectively mitigated and accordingly the cumulative impact's significance is assessed as being **negligible – negative.** Without mitigation, the impact significance is likely to be **minor - negative**.

6.5 Conclusion

Based on the assessment undertaken in this chapter, the following potential positive impacts of the proposed wind farm relate to:

- GDP growth
- Increased government revenue
- Expanded agricultural activity
- Local and preferential procurement (BBBEE, women-owned vendors etc.)
- Economic and Enterprise development benefits
- The creation of employment and skills development opportunities
- Increased household earnings and associated quality of life
- Provision of electricity for future developments

Potential negative impacts that could arise (but which can largely be mitigated) include:

- The impact on the rural sense of place and scenic integrity of the landscape. This impact is likely to be minor given the transformed nature of the landscape and the close proximity to existing developments.
- Social disruptions as a result of the influx of people
- It was also noted that many properties that are likely to have a high degree of visual exposure to the proposed wind farm already have a high degree of visual exposure to existing wind farms

and powerlines. Thus the likelihood of the proposed powerline altering their sense of place is minor.

No fatal flaws were identified as part of the socio-economic assessment.

This information suggests that, from a socio-economic perspective, that proposed development is acceptable and will have a predominately positive impact on the socio-economic environment and should be authorised.

List of References

AURECON. 2018. **Impofu Wind Farm: Specialist Terms of Reference for Basic Assessment.** Cape Town: Aurecon.

BARBOUR, T. 2007. **Guideline for Involving Social Assessment Specialists in EIA Processes**. Cape Town: Western Cape Department of Environmental Affairs and Development Planning.

CANADIAN WIND ENERGY ASSOCIATION (CanWin). 2006. **Wind Facts: Property Value**. [Online]. Available: http://www.canwea.ca/images/uploads/File/NRCan_-_Fact_Sheets/canwea-factsheet-property-v6.pdf.

DENT, P. AND SIMS, S. 2007. **What is the impact of wind farms on house prices?** [Online]. London: The Royal Institute of Charted Surveyors. Available: http://www.rics.org/za/knowledge/more-services/guides-advice/wind-farms/.

DEPARTMENT OF ECONOMIC DEVELOPMENT, ENVIRONMENTAL AFFAIRS AND TOURISM (DEDEAT). 2011. **Eastern Cape Sustainable Energy Strategy**. King Williams Town: DEDEAT.

DEPARTMENT OF ECONOMIC DEVELOPMENT, ENVIRONMENTAL AFFAIRS AND TOURISM (DEDEAT). 2016. **Eastern Cape Provincial Economic Strategy (PEDS)**. King Williams Town: DEDEAT.

DEPARTMENT OF ENERGY. 2011. **Integrated Electricity Resource Plan for South Africa - 2010 to 2030**. Pretoria: Department of Energy.

DEPARTMENT OF MINERALS AND ENERGY (DME). 2003. **White Paper on Renewable Energy**. Pretoria: DME.

DUPONTS. 2009. **Preliminary Assessment of the impact of wind on surrounding land values in Australia** [Online]. Available: http://www.lpi.nsw.gov.au/__data/assets/pdf_file/0018/117621/t0L51WT8.pdf.

EIRGRID. 2016. **An Investigation into the Potential Relationship between Property Values and High Voltage Overhead Transmission Lines in Ireland**. Dublin: EirGrid.

GOODWIN, K. 2017. **Location: Physical and Environmental Factors in Real Estate**. Property Metrics.

HINMAN, J. L. 2010. **Wind Farm Proximity and Property Values: A Pooled Hedonic Regression Analysis of Property Values in Central Illinois**. A research submitted in partial fulfilment for Masters of Science in Applied Economics at the University of Illinois, May 2010.

HOEN B., WISER, R., CAPPER, P., THAYER, M. AND SETHI, G. 2009. **The Impact of Wind Power Projects on Residential Property Values in the United States: A Multi-Site Hedonic Analysis** [Online]. Berkley: Ernest Orlando Lawrence Berkeley National Laboratory. Available: http://eetd.lbl.gov/ea/ems/reports/lbnl-2829e.pdf.

INTER-ORGANIZATIONAL COMMITTEE ON GUIDELINES AND PRINCIPLES FOR SOCIAL IMPACT ASSESSMENT, 2003. Principles and guidelines for social impact assessment in the USA. **Impact Assessment and Project Appraisal**. 21,3: 231–250.

KOUGA LOCAL MUNICIPALITY. 2015. **Kouga Municipality: Spatial Development Framework**. Jeffreys Bay: Kouga Local Municipality.

KOUGA LOCAL MUNICIPALITY. 2017. **Integrated Development Plan 2017 - 2022**. Jeffreys Bay: Kouga Local Municipality.

LANZ, J. 2019. **Agricultural and Soils Impact Assessment for Proposed Impofu West Wind Farm Near Humansdorp, Eastern Cape - EIA Scoping Phase Report**.

LAWSON, Q AND OBERHOLZER, O. 2019. **Visual Impact Assessment Scoping Phase**. Proposed Impofu East Wind Energy Facility, Eastern Cape Province. Prepared for Red Cap Energy (Pty) Ltd.

NATIONAL PLANNING COMMISSION (NPC). 2011. **National Development Plan 2030 Our Future – Make it Work**. Pretoria: NPC.

QUANTEC. 2016. **Standardised Regional Database**. [Online] Available: http://www.easydata.co.za/. [Accessed: 9 March 2018].

REPUBLIC OF SOUTH AFRICA. 2008. **National Energy Act, Act No. 34 of 2008**. Pretoria: Government Gazette.

SARAH BAARTMAN DISTRICT MUNICIPALITY. 2013. **Sarah Baartman Spatial Development Framework**. Port Elizabeth: Sarah Baartman District Municipality.

SARAH BAARTMAN DISTRICT MUNICIPALITY. 2017. **Integrated Development Plan 2017-22**. Port Elizabeth: Sarah Baartman District Municipality.

SCHWARZ, A. 2019. **Red Cap Energy Impofu East Wind Farm: Traffic Impact Assessment, Prepared for Red Cap (Pty) Ltd**.

SOUTH AFRICAN WIND ENERGY ASSOCIATION (SAWEA). 2019. **SAWEA presentation to the President of South Africa, January 2019**.

STATS SA. 2016. **Community Survey 2016**: Statistical Release. Pretoria: Stats SA.

STERZINGER, G., BECK, F. AND KOSTIUK, D. 2003. **The Effect of Wind Development on Local Property Values: Analytical Report. [Online].** Washington, D.C.: Renewable Energy Policy Project. Available: http://www.repp.org/articles/static/1/binaries/wind_online_final.pdf.

TRABISH, H.K. 2010. **Operations and Maintenance: Keys to Wind Farm Profitability.**

WASATCH WIND. 2011. **Frequently Asked Questions for Landowners**. [Online]. Available: http://www.wasatchwind.com/landowners/faqs#paid.

WOLVERTON, M.L. AND BOTTEMILLER, S.C. 2003. Further analysis of transmission line impact on residential property values. **The Appraisal Journal**, Vol. 71 No.3, pp.312-27.

3E RENEWABLE ENERGY SERVICES. 2019. **Noise and Shadow-Flicker Study**. Impofu East Wind Farm. Prepared for Red Cap Impofu East (Pty) Ltd.

Annexure 1: Specialists' Curriculum Vitaes

Elena Broughton

Date of Birth:	11 September 1980
Designation:	Unit Manager: Innovation & Sustainable Development
Profession:	Senior Development Economist
Specialisation:	Sustainable Development Specialist
Years within Firm:	13 Years
Nationality:	Russian
Years of Experience:	13 Years
HDI Status:	White Female

Education:	
University of Pretoria - 2011	MSc (Technology Management)
University of Pretoria - 2007	BScHons (Technology Management)
Parkland College, USA - 2004	Computer Integrated Accounting
Parkland College, USA - 2004	Independent Business
Parkland College, USA - 2003	Intermediate Accounting
Parkland College, USA - 2003	Records Management
Parkland College, USA - 2003	Financial Accounting
Parkland College, USA - 2003	Managerial Accounting
Nizhny Novgorod University, Russia - 2002	BComHons (Economics)

Professional Membership:
SAPOA Urban-Econ Development Economists (Pty) Ltd

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

Work Experience:

2004 - Current	Urban-Econ Development Economists (Pty) Ltd

Key Qualification:

Elena Broughton completed her BComHons in Economics in Russia, at Nizhny Novgorod State University in 2002 specialising in regional economics. At the same time, she completed an additional degree as Translator/Interpreter in Professional Orientated Communication. After completion of her Honours degree in Economics, Elena moved to the USA and stayed there for 1.5 years. During her stay in the USA, she completed a number of Accounting and Business courses at Parkland College, Illinois. In 2007, she obtained her BScHons in Technology Management (Cum Laude) at the University of Pretoria and later received her MSc in Technology Management (2011) from the same university.

Elena Broughton is a senior professional at Urban-Econ and has an extensive knowledge in various fields of economic development, including impact assessments, investment strategy formulation, strategic decision analysis, and monitoring and evaluation. She is experienced in developing input-output and SAM-based models, as well as development and application of other econometric techniques. Elena has a special interest in project evaluation and decision-making framework, with the latter being the focus of her Master's dissertation. Over the past few years, she was able to extend her experience in these fields working on projects for both government and the private sector. Elena is managing the Innovation & Sustainable Development Unit and has successfully completed various energy and innovation projects in this capacity.

Experience Record:	
Project:	The Localisation Potential of Photovoltaics (PV) and a Strategy to support large scale roll-out in South Africa
Year:	June 2012 – March 2013

Location: **Client:** **Project Features:** **Activities Performed:**	**National** **WWF S, South African Photovoltaic Industry Association (SAPVIA), and the Department of Trade and Industry, RSA** ▪ **Describing of the global PV industry and its trends** ▪ **Profiling of the local PV industry** ▪ **Analysing of the local PV value chain considering three market segments, i.e. rooftop, commercial and utilities** ▪ **Analysing of financial dynamics of the market and standardisation requirements** ▪ **Determining the potential for localisation in the country** ▪ **Developing a strategy for the future roll-out** **Policy environment review, market segments analysis, demand analysis, value chain analysis, pricing of components, local content analysis, potential for localisation assessment, strategy formulation** **The goal of the study was to describe the global and local PV industry trends and dynamics, and to develop localisation scenarios for the purposes of providing recommendations with respect to the future roll-out of the industry.**
Project: **Year:** **Location:** **Client:** **Project Features:** **Activities Performed:**	**Feasibility study into establishing CSP component manufacturing facilities in South Africa** **November 2012 – February 2013** **National** **The Industrial Development Corporation, RSA** ▪ **The identification of various CSP technologies and systems that are promoted internationally** ▪ **And various designs and configuration of each technology.** ▪ **An overview of the international and local CSP market, the major materials and components of CSP with a view of establishing a local manufacturing base of CSP systems and components** ▪ **The identification of key technical and technology partner in the development of the manufacturing facility** ▪ **Engagement with the potential technical partner to determine whether the IDC can capacitate the supplier to manufacture components and systems locally** ▪ **Identification of a suitable location for the new facility or expansion of existing local CSP component manufacturing facilities in South Africa** ▪ **The amount of potential jobs that will be created from expansion or creation of a new facility, preliminary financial model and CAPEX budget.** **Global CSP industry analysis, value chain analysis, local industrial capabilities assessment, demand analysis, job creation potential analysis**
Project: **Year:** **Location:** **Client:** **Project Features:** **Activities Performed:**	**Northern Cape Renewable Energy Strategy** **November 2012 – June 2013** **National** **The Northern Cape Department of Economic Development and Tourism, RSA** ▪ **Description of the status and potential of the local renewable energy sector** ▪ **Investigation of the potential to establish clean and green sustainable development projects in the Province in line with the optimal mix identified.** ▪ **Identification of income generation opportunities for the purpose of revitalising rural communities** ▪ **Assessment of the institutional capacity and capability** ▪ **Strategy and implementation plan formulation** **Policy environment analysis, renewable energy industry profiling, desired state of industry analysis, market segmentation and demand analysis, stakeholder analysis and institutional structures review, strategy formulation**
Project: **Year:** **Location:** **Client:** **Project Features:**	**A study of the factors contributing to successful technology commercialization** **March 2015-September 2015** **National** **The dti** • **Current context and framework for technology commercialisation in South Africa** • **Identification of critical factors and resources required for successful commercialisation**

Activities Performed:	• On-line survey • Interviews with numerous stakeholders (universities, businesses, government organisations) • Case study analysis of policies and interventions in other countries • Profiling of the current policy environment, funding mechanisms and stakeholders • Identification of mechanisms and interventions to assist in commercialisation of technologies • Formulation of a guide for commercialisation Project management and quality control, presentation of study findings
Project: Year: Location: Client: Project Features: Position held: Activities Performed:	Assessment of policy to enable the implementation of energy efficiency in the building sector December 2014-April 2015 National SANEDI/Department of Energy • Assessment of existing national and local government policy frameworks (legislations, standards, policy, building codes etc.) with respect to constraints and opportunities created for implementation of energy efficiency in the building sector • Interview various stakeholders • Review of interventions and support mechanisms • Undertake case studies • Provide policy recommendations Project manager Project management and quality control, presentation of study finding
Project: Year: Location: Client: Project Features: Position held: Activities Performed:	A Study of the Economic Impact of load shedding on the City of Johannesburg with or without Kelvin Power Station January 2015 – June 2015 City of Johannesburg City of Johannesburg Metro • Developing a model of electricity usage by various economic sectors based on information supplied by City Power • Profiling economic structure of Coty of Joburg regions • Modelling of the potential economic impact on the City with and without Kelvin Power Station, in the short-term and the impact of outages on the City as a whole over the medium-term; • Interview large electricity users in the City • Interpreting economic effects of load shedding derived from the modelling exercise in the context of the CoJ economy, and specifically its implications on the production, Gross Domestic Product per region (GDP-R), and employment Senior Economist Economic modelling, report quality control, presentation of findings
Project: Year: Location: Client: Project Features: Position held: Activities Performed:	Global Energy Efficiency options: Energy efficient technologies, policy and institutional requirements for adoption in South Africa July 2015 – February 2016 National The dti/the Industrial Development Corporation • Profiling of full range of Energy Efficiency options currently being utilised globally in the building and industrial/mining sectors • Assessment of technologies favoured by countries that have successfully implemented EE measures • Explore policy initiatives and incentives that contribute to both the greening of industries and the establishment of new green industries • Developing a cost and savings potential model to evaluate technologies Project Manager Project management and quality control, presentation of study findings, costing and saving model development
Project:	Feasibility study of high temperature applications for South Africa

Year:	October 2014 – February 2015
Location:	National
Client:	CSIR/the Department of Science and Technology
Project Features:	• Profile HTA technologies • Assess South Africa's readiness and need for HTA • Assess the current and projected future requirements for HTA • Evaluating the prospects (technical and economic) of HTA in South Africa • Determine RDI opportunities for the country • Formulate and action plan and providing recommendations appropriate for the implementation programme
Position held:	Project Manager
Activities Performed:	Project management and quality control, engagement with industry stakeholders

Other Projects:

- Sustainable Energy Consumption and Production (SECP) in agriculture and integrated waste management - research and training: Sustainable Energy Consumption and Production (SECP) is a programme designed and implemented by the Renewable Energy and Energy Efficiency Partnership (REEEP). REEEP partnered with SANEDI to implement the initiative in South Africa, in order to assist the local business communities and entrepreneurs in the agricultural and waste management sectors to implement Sustainable Consumption and Production (SCP) practices within their respective industries. Urban-Econ was appointed to undertake a study into agriculture and integrated waste management with a specific emphasis on SECP practices employed in these two sectors and opportunities that exists for SECP deployment. The study reviewed the value chains within three agricultural sub-sectors, the energy intensity of different agricultural activities and waste generated by these. It identified the opportunities for energy efficient and renewable energy technologies and practices deployment, reviewed 23 case studies, and provided information on financial-and non-financial support that South African farmers could access to assist them in taking up the identified energy efficient and renewable energy technologies and solutions. A training manual was developed and a number of workshops were conducted in three provinces, i.e. Gauteng, Western Cape, and Free State
- Feasibility study on biogas feedstock availability and characterisation: The CSIR main campus is envisaged to become energy autonomous in five to eight years. A number of alternative energy solutions are considered, one of which is a biogas project. The energy Centre at the CSIR appointed Urban Econ to undertake the assessment of the potential organic waste feedstock that could be gathered within 50km radius from the site. They study included analysis of the biomass availability, review of environmental benefits, and recommendations for the most cost-efficient sources of organic waste feedstock that could be explored.
- Go-to-Market Strategy for a PV/Panel Manufacturer: Urban-Econ together with EScience Associates and Tracy Stewart Consulting was appointed by the CEF to undertake a Go-to-Market Strategy for a PV panel manufacturing facility. The project consisted of two major parts. The first component included the analysis of the market and opportunities presented in the market, as well as identification of the needs, affordability levels and requirements by all groups of stakeholders in the industry's value chain. The second part of the study included the formulation of the strategic plan that outlined various target markets to be pursued, value proposition to be offered, market channels to be considered for entering the market and activities to be implemented during the product pre-launch, launch and post-launch phases.
- High-tech bio-sciences incubator feasibility study: The study focused on the assessment of the feasibility of establishing a physical high-tech bio-sciences incubator at the Innovation Hub in Gauteng, South Africa. It involved the investigation into the most feasible location, market viability, service offerings, operational requirements, and seed funding requirements.
- High-tech chemical sector incubator feasibility study: The study focused on the assessment of the feasibility of establishing a high-tech chemical sector incubator in Gauteng, South Africa. It involved

the investigation into the most feasible location, market viability, service offerings, operational requirements, and seed funding requirements.

- Promotion of Decent work in Southern African Ports (phase ii): The study focused on the independent assessment of progress to date of the project across all the outcomes; assessing performance as per the foreseen targets and indicators of achievement at output level, strategies and implementation modalities chosen, partnership arrangements, constraints and opportunities in both Mozambique and South Africa. It provided strategic and operational recommendations as well as highlighted lessons to improve performance and delivery of project results. to port workers.
- A feasibility study and a business plan for downstream beneficiation of fly ash in the Nkangala District Municipality: Large volumes of coal fly ash (CFA) are being produced at power stations in Mpumalanga. CFA is already used as a cement extender by local cement factories; however, CFA has numerous other applicants that are not properly explored. The study therefore aimed at investigating all possible opportunities that could be derived from CFA beneficiation and identification of those that could be realised in Nkangala.
- Matjhabeng Solar Park: Socio Economic needs analysis and plan formulation: The study focused on the community of Matjhabeng, the Free State Province. It involved the identification of the socio-economic needs and priorities for the local communities, creating an inventory of social facilitates and small enterprises, and running a skills registrar. Aside from the secondary data review, 100 households were surveyed, 35 social facilities were profiled, and 30 businesses were audited. a skills development, a social facilitates, and enterprise development investment plans for the project developer were formulated.
- Examining the possibility of attracting corporate social investment (CSI) into water research and development: The study aimed at obtaining feedback from a sample of corporate representing a variety of industries with regard to the possibility and appetite to invest CSI funds in deploying water and sanitation related solutions in communities targeted by them.
- Go-to-Market Strategy for a PV/Panel Manufacturer: Urban-Econ together with EScience Associates and Tracy Stewart Consulting was appointed by the CEF to undertake a Go-to-Market Strategy for a PV panel manufacturing facility. The project consisted of two major parts. The first component included the analysis of the market and opportunities presented in the market, as well as identification of the needs, affordability levels and requirements by all groups of stakeholders in the industry's value chain. The second part of the study included the formulation of the strategic plan that outlined various target markets to be pursued, value proposition to be offered, market channels to be considered for entering the market and activities to be implemented during the product pre-launch, launch and post-launch phases.
- SunCorp Socio-Economic and Enterprise Development Plan Formulation: Urban-Econ was appointed by SunCorp to develop a Socio-Economic Development and Enterprise Development Plan for a Solar PV project in the Free State. The plans were devised in line with the DOE requirements outlined for the bidding phase.
- Savanna Cookware Manufacturing Facility Pre-Feasibility Study: Urban-Econ undertook a pre-feasibility study for a manufacturing facility planned to produce luxurious stainless-steel cookware in South Africa. The pre-feasibility study focused on determining the need and desirability for the proposed manufacturing facility considering the defined primary and secondary markets, the key prerequisites for the viability of the proposed venture and the most optimal location for the proposed manufacturing facility.
- An Opportunity Cost Assessment for the proposed Labonte 5 Mining Project: The purpose of the study was to investigate the opportunity cost of the proposed sand mining project to determine the implications on the local economy dynamics and the impact on the major infrastructure projects implemented in the Lephalale area if the proposed project is not approved.
- Saldanha Bay Separation Plant Economic Impact Assessment: The project involved undertaking an Economic Impact Assessment study for the proposed construction and operation of a Rare Earth Elements (REE) Separation Plant on Portion 6 of the Farm Langeberg 188 in Saldanha, in the Western

Cape Province. The study formed part of the Environmental Impact Assessment process as prescribed in the National Environmental Management Act (NEMA) of 1998 and its subsequent amendments.

- Zandkopsdrift Rare Earth Elements (REE) Project Economic Impact Assessment: The project involved undertaking a Socio-Economic Impact Assessment study for the proposed the Zandkopsdrift Rare Earth Elements (REEs) Project near Garies in the Northern Cape Province of South Africa. The study formed part of the Environmental Impact Assessment process as prescribed in the National Environmental Management Act (NEMA) of 1998 and its subsequent amendments.
- Balmoral EIA: The study involved undertaking a Socio-Economic Impact Assessment as an input into a Basic Impact Assessment Study for the proposed Balmoral X5 Township Development in the Ekurhuleni Metropolitan Municipality (EMM).
- Green Building Market Entry Study: The Embassy of the Kingdom of the Netherlands in Pretoria appointed Urban-Econ to undertake a market entry study for the Green Building Industry of South Africa. The document was compiled for the purpose of guiding the existing or prospective Dutch companies in expanding or involving themselves in the South African Green Building Industry. The report contained information on the policy and regulatory environment that drives the development of this sector in the country and the broad overview of the status of the construction industry with the focus on the green building industry. The document also encompassed information on the state of development and industry maturity of selected green building sub-sectors that are aligned with the expertise of the Dutch companies. Information on doing business in South Africa as far as procurement and tendering practices, business funding and other support offered by South Africa and Netherlands, was also provided.
- Royal Bafokeng Mining Procurement Study: The study identified business opportunities that can be established in the area leading to the localisation of mining inputs. It was based on a comprehensive assessment of the selected mine's contract-based procurement practices.
- Ventersburg Business Development Concept: The study focused on the identification of business development opportunities that could be pursued in the town of Ventersburg based on the traffic derived in the area from the N1 highway and other regional roads. The study involved a comprehensive assessment of the target markets induced by traffic, economic base of the area, current business offerings and derived opportunities. It concluded with a presentation of business development concept scenarios and associated socio-economic benefits.
- Eskom CSP (Solar 1) Macroeconomic Impact Assessment: The study involved the identification of potential localisation opportunities for various components of the project and modelling of the socio-economic impact.
- Proposed Exxaro IPP Coal-Powered Power Station - Lephalale Scoping Inputs: Urban-Econ was appointed to undertake a Socio-Economic Scoping Study and Land-Use Impact Study for the proposed Exxaro Coal-Powered Power Station near the town of Lephalale, Limpopo Province.
- Mafube Nooitgedacht and Wildfontein EIA/EMP Sustainable Development Investigation Study: Urban-Econ was appointed to undertake an investigation into sustainable development options associated with the proposed project. The results of this study aimed at informing the decision makers of socio-economic trade-offs related to each option analysed and the preferred alternative.
- Thaba Metsi Sustainable Development Investigation Study: The objective of the Thaba Metsi Project is to mine coal via opencast and underground mining methods for supply to the Independent Power Producer (IPP) coal-fired power station, to be developed by Exxaro, north of the proposed Thaba Metsi project. Urban-Econ provided a specialist input into the sustainable development Investigation aimed at quantifying and assessing various options associated with the development and post-mining land uses that formed part of an input into the EIA report.
- Eskom Sere Wind (WEF1) Macro-Economic Impact Assessment: The project entailed the strategic assessment of the proposed facility on the macro-economic situation with respect to the impact on the balance of payments, supply of energy, demand for water, and achievement of strategic government objectives. It also entailed the assessment of the proposed project on the regional and local economies.
- Evaluation of Energy-Related Proposals for the Department of Science and Technology: Urban-Econ was appointed to undertake an evaluation of six energy-related proposals submitted to the DST SBS.

The objective of the evaluation is to advise the Department on whether the projects described in the proposals should be funded or not. The assessment takes into account operational and financial feasibility of projects, alignment thereof with government objectives, economic benefits derived from the project, ability of the organisations to implement the projects successfully and a risk assessment. The project also involved the development of a decision framework based on a Multi-Criteria Decision Method to be used to compare proposals and determine suitability for funding and prioritisation.

- Independent Evaluation of the Wireless Mesh Network in Government Broadband: Urban-Econ was appointed to undertake an independent evaluation of the Community Wireless Mesh Networks in the Government Broadband project. Urban-Econ's responsibility was to evaluate the progress of the project and provide recommendations that can be implemented to improve its design and execution.
- Eskom Ariadne-Eros Power Lines Economic & Agricultural Impact Assessment: Urban-Econ was appointed to undertake an Agricultural Potential and Economic Impact Assessment for the proposed Ariadne-Eros Transmission Power Line and expansion and upgrade of the related substations in KwaZulu-Natal.
- Eskom Ingula Pumped Storage Scheme Regional Economic Impact Assessment: The purpose of the study was to present an assessment of socio-economic impact of the Ingula Pumped Storage Scheme on the national and regional economies.
- Gauteng Infrastructure Renewal and Investment Plan (GIRIP): The study involved the formulation of an Infrastructure and Renewal Plan up to 2025 that would transform Gauteng into a competitive Global City-Region. As part of the study a regional model with necessary demographic and economic projects was developed that assisted in identifying future infrastructural needs in the Province.
- De Hoop Dam Economic Impact Monitoring Framework: Urban-Econ was approached to develop and set up an integrated and coherent monitoring and evaluation reporting system which will primarily be based on a regional impact assessment model framework to monitor and evaluate the regional socio-economic impacts due to the development of the De Hoop Dam.
- North West Cluster Performance Analyses: Urban-Econ was appointed by the North West Office of the Premier to undertake the analysis of statistics tables for six clusters (Human Resource Development, Physical Assets, Resource Base, Governance and Protection, Economic and Social), identify areas that require interventions and propose possible solutions to address the key challenges.
- Mopani Investment Strategy: Urban-Econ was appointed by the Mopani District Municipality to formulate an investment strategy for the region with a focus of promoting integrated and sustainable development in the local economy.
- Socio-Economic Impact Assessment - Proposed Route Operator Business in Mpumalanga: The project entailed assisting with the preparation of the response to the Request for Applications in respect of Limited Pay-out Machine Licences in the Mpumalanga Province. The study encompassed a macro-level socio-economic analysis of the proposed route operator business in Mpumalanga with a focus on: (a) benefits to the economy in terms of gross geographical product ("GGP"), employment creation, increased household income, skills development and small, medium, micro enterprise ("SMME") development and (b) potential social impact of gaming in the Province.
- N3 Highway Economic Impact Assessment: Urban-Econ was appointed to determine the Socio-Economic Impact of the proposed re-routing of the N3 highway around Harrismith and the current link with the N5 Route towards Lesotho and Mangaung.
- The Mandela Bay Precinct Economic Impact Assessment: The study entailed conducting an economic-impact assessment of the proposed Mandela Bay Precinct Development in Port Elizabeth. The proposed project was a mixed-use development with the main component being a Regional Shopping Centre that will be surrounded by high density residential property, filling stations, light industrial space, a hospital, and a hotel and office space.
- The City of Windhoek Draft SME Policy: Urban-Econ was appointed by the City of Windhoek (COW) Local Authority to develop a Draft SME Development Policy Directive to guide future SME promotion and development in the City of Windhoek

- Harrismith Logistics Hub Impact Assessment: Urban-Econ Development Economists was appointed to undertake a rapid economic impact assessment study of the proposed Harrismith Freight Logistics Hub ("HLH"). The aim of the study was to determine potential benefits that could be created by the HLH in terms of unlocking the latent development of the area. This technical memorandum presents the results of the study.
- Megamall Economic Impact Assessment: Urban-Econ was requested to undertake an economic impact study for the Megamall project to be developed in the Mogale City Local Municipality. The aim of the study was to determine the potential economic impacts emanating from the proposed development. This study involved assessment of socio-economic impacts the proposed project could have on the local economy which could be used in application for funding from commercial banks and government.
- Coega Ridge Economic and Social Impact Assessments: Urban-Econ was appointed to undertake an economic and social impact assessment of the proposed Coega Ridge development. The aim of the development was to create a unique and sustainable residential enclave encompassing a "live, work, play and shop" environment including components such as affordable housing, shopping centre, office park, industrial park, community and social facilities, bulk service infrastructure, and public open space.
- Amanzi Economic & Social Impact Assessment: Urban-Econ was requested to undertake an economic and social impact study for the proposed Amanzi Estate that included the original homestead of Sir Percy Fitzpatrick, author of Jock of the Bushveld.
- Limpopo Industrial Parks Resuscitation Assessment: Urban-Econ was appointed to assess the feasibility of resuscitation of the selected industrial parks in the Limpopo Province. The study included analysis of the economic potential of the selected areas, development of scenarios and formulation of recommendations. Urban-Econ managed the team of sub-consultants.
- North West PGDS Monitor: The study encompasses a comprehensive analysis and projections of the achievement of the PGDS targets, reviewing the performance of the Working Groups and providing recommendations regarding actions needed to be taken to address the shortfalls.
- Sedibelo Economic Impact Assessment: The study involved conducting an economic-impact assessment of the proposed development utilising, an Input/output model.
- Hanglip Sustainability Model: Urban-Econ was appointed to develop a model that could assist decision makers in identifying the most preferred alternative/s for the Hanglip Development. The model was based on the Multi-Criteria Decision-making process.
- Emalahleni Investment Incentive Package: Urban-Econ was appointed by the Emalahleni Local Municipality to update the Investment Incentive Package for the Emalahleni Local Municipality.
- Eastern Cape Industrial Sector Study: Urban-Econ was appointed by the Eastern Cape Socio-Economic Consultative Council (ECSECC) to undertake an industrial sector study for the Eastern Cape Province. The study provided inputs to the Provincial Industrial Strategy. The focus of the strategy was on provision of support to sectors with the potential for job creation in the Province. In this context, this study aims at identifying the sectors that have the highest potential for uplifting the second economy in the Province and highlighting their growth barriers.
- Socio-Economic Impact Assessment of the Proposed New Eskom Power Stations in the Witbank Area and Northern Free State: The study involved conducting a socio-economic impact assessment of the proposed developments utilising an Input/Output model.
- Sedibeng Investment Incentive Package: The study encompasses a formulation of an incentive package that would enhance development and investment in the area, as well as promote economic growth. A comprehensive socio-economic analysis of the Sedibeng DM and its Local Municipalities, including growth potential was performed.
- North West Sustainable Development Indicators Pilot Project: After completing the North West Sustainable Development Indicators, Urban-Econ was appointed to execute of the pilot project of population the framework. Urban-Econ has been appointed by the North-West Province's Office of the Premier to formulate a Sustainable Development Indicator Framework for the North West Provincial Administration. The purpose of the framework is to assist the provincial government

authority in the monitoring and evaluation of their progress towards achieving sustainable growth and development.

- Polokwane Trade Hub: Urban-Econ assisted by Nyeleti Consulting Engineering, was appointed by Polokwane Municipality to undertake a Polokwane Trade Hub Feasibility study. The feasibility study included investigation of the potential of Polokwane to develop into a regional trade hub, implications associated with its development and the initiatives, including programs and projects that need to be implemented to realise the vision of Polokwane as a regional trade hub.
- Mpumalanga Job Creation Budget: The project involved an assessment of the provincial budget with respect to its impact on job creation and identification of opportunities to enhance sustainable job creation in the Province.
- Joburg BPO Zone: Urban-Econ was appointed to provide an urban-economic rationale and motivation for the selection of a BPO Precinct in the Joburg Inner City.
- Bekkersdal Skills and Entrepreneurship Development Strategy: The Bekkersdal Skills and Entrepreneurship Development Strategy provides the reader with thorough data on the existing pool of enterprises and entrepreneurs, services and products and existing skills in Bekkersdal, which can be utilised by public and private entities. The document includes Skills Audit and Business Audit Databases in Access format.
- Baralink Economic and Market Study: Urban-Econ has been appointed by Urban Dynamics to undertake an economic and market study of four areas, namely, Baralink, JP's Town, Orange Farm, and Kwadzudza and provide the feedback on potential economic activates that can be introduced to the area in regard to promotion of sustainable livelihoods. This study forms a part of a comprehensive analysis of the abovementioned areas, the purpose of which is to compile a strategy for sustainable housing development, according to the new housing policy, in different regions of Johannesburg Metropolitan area.
- Business Improvement District Strategy for Bekkersdal: Due to the low levels of consumer and business confidence in the Bekkersdal CBD, this project required the formulation of a strategy for the establishment and implementation of a BID for the CBD area of Bekkersdal.
- Expansion of Holcim Cement Plant- Economic Impact Assessment: Urban-Econ has been appointed to assess economic impact of the expansion of Holcim Cement plant in Roodepoort.
- Madiba Bay Leisure Park Regional Mall Market Study: Urban-Econ was commissioned by East Cape Showcase (Ltd.) to conduct empirical market research and compile a specialist market study for the proposed regional retail mall within the North Gate precinct of the Madiba Bay Leisure Park project.
- Social and Labour Plan for Brandbach Mine, Cullinan: In order to insure sustainable development of the industry in the future along with the implementation of national visions on skills development, poverty alleviation, BEE and employment creation, the government has introduced a Skills and Labor Plan, preparation of which became a prerequisite for every mine in the country. Urban-Econ has been appointed to develop such plan for the Brandbach Mine in Cullinan.
- NIPS for POPS Economic Impact: Urban-Econ has been appointed as part of a specialist team to undertake the economic impact assessment of Infrastructure related to Persistent Organic Pollutants (POPS) in South Africa. The focus of the assessment is to formulate clear strategic guidelines related to the impacts of POPS and or their removal/eradication for the Development of National Implementation Plans (NIPS) of the Stockholm Convention on POPS.
- Other Socio-Economic and Economic Impact Assessment Studies for Renewable Energy Projects conducted as part of the Environmental Impact Assessment Processes
- Arriesfontein Solar Energy Park: near Danielskuil in the Northern Cape (100 MW CSP-Tower facility and 225 MW PV solar facility)
- Humansrus Solar Energy Facility: near Postmasburg in the Northern Cape (100 MW CSP-Tower facility)
- Rooipunt Solar Energy Park: near Upington in the Northern Cape (100 MW CSP-Tower facility and 215 MW PV solar facility)
- Farm 198 PV Solar Energy Facility: north of Kimberley in the Northern Cape (210 MW PV solar facility)
- Wag'nbiekiespan PV Solar Energy Facility: near Boshof, the Free State Province (75 MW PV solar facility

Countries of Work Experience:

- South Africa
- Russia
- Zambia

References:

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Matthew Keeley

Date of Birth:	25 February 1985
Designation:	Director/Manager -Eastern Cape
Profession:	Senior Development Economist
Specialisation:	Economic Impact Assessment, Property Market Analysis
Years within Firm:	10 Years
Nationality:	RSA
Years of Experience:	10 Years
HDI Status:	White Male

Education:	
Rhodes University – 2004 to 2006	Bachelor Degree in Geography and Economics
Rhodes University & University West (Sweden) 2007	Post Graduate Honours Degree in Economic Geography

Professional Membership:
SAPOA Urban-Econ Development Economists (Pty) Ltd
Society of South African Geographers - Membership # 05/15

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

Work Experience:

2008 - Current	Urban-Econ Development Economists

Key Qualification:

Matthew Keeley is the Eastern Cape Regional Branch Manager of Urban-Econ Development Economists and oversees all of the company's provincial research projects. Matthew obtained his Bachelor's degree majoring in Geography and Economics from Rhodes University; this was followed by an Honours degree in Economic Geography (Spatial Development), part of which was studied at University West, Sweden. Matthew's fields of professional interest include Economic Property Market Analysis and Socio-Economic Impact Assessments. Matthew's professional experience has involved the project management of a number of high-profile economic planning projects as well undertaking a variety of economic market analysis projects. Areas of Matthew's project experience are listed below:

- Project Management
- Economic Property Market and Trend Analysis
- Strategic Economic Development Potential Analysis
- Geographic Information Systems (GIS)
- Socio-Economic Economic Impact Analysis
- Local Economic Development Planning
- Business Plan Development
- Socio-Economic Research and Statistical Profiling

Experience Record:	
Project:	Coega Infrastructure and Investor Economic Impact Assessment
Year:	2008-2009
Location:	Nelson Mandela Bay, Eastern Cape
Client:	Coega Development Corporation
Project Features:	Urban-Econ Eastern Cape were appointed by the Coega Development Corporation (CDC) to assist in conducting an Economic Impact Assessment for the Coega IDZ. The main objectives for the project included the quantifying of the economic impact of infrastructure and investors within the Coega IDZ to date. It also included a component of developing the capacity of the CDC to assess impacts of potential investors and

Position held:	providing the CDC with guidelines on how to improve positive impacts associated with investments in future.
Activities Performed:	Project Manager / Project Economist Project management; Economic Impact Assessment; Training and capacity building; report writing.
Project:	MBDA Stadium Precinct Development Plan
Year:	2011
Location:	Nelson Mandela Bay, Eastern Cape
Client:	Mandela Bay Development Agency (MBDA)
Project Features:	Urban-Econ project managed a multi-disciplinary team which investigated the viability of establishing additional commercial and leisure property/activities in the immediate surrounds of the new Nelson Mandela Bay Stadium in Port Elizabeth. Investigated the viability of establishing additional commercial and leisure property/activities.
Position held:	Project Manager
Activities Performed:	Project management; client and stakeholder liaison; economic profiling; analysis of multi-disciplinary team inputs; Property Market Research; Opportunity analysis; Project packaging
Project:	Lesotho Renewable Energy Master Plan
Year:	2010 – 2011
Location:	Kingdom of Lesotho
Client:	Lesotho Electricity Company
Project Features:	Urban-Econ was appointed to undertake detailed economic analysis of potential power generation plants identified throughout Lesotho culminating in a comprehensive prioritisation analysis of various projects and their potential contributions to the Kingdom's economy.
Position held:	Project Economist
Activities Performed:	Detailed economic analysis of potential power generation plants; Country Analysis; RE Sector Analysis.
Project:	EPWP Phase 2 Economic and Social Impact Assessment
Year:	2014
Location:	Eastern Cape
Client:	Department of Public Works
Project Features:	Urban-Econ was appointed to undertake an Impact Assessment on the Implementation of the Expanded Public Works Programme Phase 2 (2009-2014) in the Province of the Eastern Cape. The EPWP is a nationwide programme covering all spheres of government and state-owned enterprises.
Position held:	Project Manager
Activities Performed:	Project management; Client liaison; Economic profiling.
Project:	Eastern Cape Tourism Database and Geospatial Profile
Year:	2013
Location:	Eastern Cape
Client:	Department of Economic Affairs
Project Features:	The project involved the collation, consolidation and spatial representation of tourism product information for the Eastern Cape using GIS as an analysis tool. The project was hailed as the first provincial database of its kind in RSA and will be soon integrated as a web-based platform.
Position held:	Project Manager
Activities Performed:	Project management; Client liaison; Database development; Tourism primary research.

Other Projects:

- Industrial Implementation Plan for the Eastern Cape (EC PIDS): Urban-Econ was commissioned as part of a consortium of industrial specialists; to project manage and develop an Industrial Implementation Plan for the Eastern Cape, on behalf of the Eastern Cape Department of Economic Development and Environmental Affairs (DEDAET). The aim of the study was to provide an action-orientated implementation plan to implement the existing Eastern Cape Industrial Strategy; as well as to fill information gaps with regards to key sectors in the Eastern Cape. Thus, a team of sector specialists in agro-processing, petro-chemicals, automotive, green energy, tourism and capital goods was

assembled. Urban-Econ's role was in the overall project management, implementation action framework development and workshop facilitation. The study included the development of a situation analysis for the province, sector potential analysis, opportunity assessment and clustering identification. The outcome of the strategy was an Implementation Framework and Capital Investment Framework.

- ECPTA Reserves as Products: Urban-Econ Development Economists was appointed by the Eastern Cape Parks and Tourism Agency (ECPTA) to investigate ECPTA Reserves as Tourism products. The purpose of the assignment being to provide a business case on profiling the ECPTA nature reserve clusters in terms of their natural endowment and associated product offerings within the dual mandate of managing biodiversity conservation and destination tourism. A full socio-economic benefit analysis was required to support decision making to achieve the most efficient and effective balance and co-existence of the dual mandate as well as compliance with all applicable legislation.
- Sterkspruit Urban Regeneration Plan: Urban-Econ was appointed by the Senqu Local Municipality to undertake an innovative Economic Development Concept for the town of Sterkspruit within the Senqu Local Municipality. The objective was to have a development plan that informs planning, economic and social infrastructure as well as expected economic spin-offs for the area.
- uBuntu Wool Washing Business Plan: Urban-Econ Development Economists in partnership with A.I.M was appointed by the Department of Agriculture, Land Reform and Rural Development in conjunction with the Ubuntu Local Municipality to undertake a comprehensive feasibility study for the proposed development of a Wool Washing Facility in the town of Loxton in the Northern Cape Province.
- Ludeke Dam Feasibility Study: Urban-Econ formed part of a consortium undertaking a feasibility assessment of the potential around the Ludeke Dam for tourism applications. Aspects of the project included an assessment of the market feasibility of establishing tourism accommodation and facilities at the Ludeke Dam. Consideration of supply and demand factors in quantifying the potential viability of a tourism development. Taking into account best practise and lessons learnt from similar developments in SA. Formulation of an optimum development concept to inform the project technical team to take forward towards design. Providing Alfred Nzo District with specific implementation guidelines to take forward the project towards development. Identifying key stakeholders and potential role-players critical to the success of the research and implementation process.
- Ntenetyana Dam Feasibility Study: Urban-Econ formed part of a consortium undertaking a feasibility assessment of the potential around the Ntenetyana Dam for tourism applications. Aspects of the project included an assessment of the market feasibility of establishing tourism accommodation and facilities at the Ntenetyana Dam. Consideration was made of supply and demand factors in quantifying the potential viability of a tourism development. Taking into account best practise and lessons learnt from similar developments in SA. Formulation of an optimum development concept to inform the project technical team to take forward towards design. Providing Alfred Nzo District with specific implementation guidelines to take forward the project towards development. Identifying key stakeholders and potential role-players critical to the success of the research and implementation process.
- Provincial Rural Development Plans: Urban-Econ formed part of the Urban-Dynamics team which was appointed to the panel of service providers to assist the Department of Rural Development and Land Reform to develop Spatial Plans, Rural Development plans and related tools to implement the Spatial Planning and Land Use Management Act, Act no.16 of 2013.
- Coffee Bay Town Promulgation Plan: Urban-Econ was appointed as lead consultants to investigate the legal and institutional processes necessary to set up a new municipal town in the areas of Coffee Bay and Hole in the Wall on the Eastern Cape Wild Coast. This study is seen as a pilot project which will serve as a blue-print for future town establishments in the region going forward. The study was commissioned by ECSECC in partnership with the Department of Economic Development, Environmental Affairs and Tourism (DEDEAT). Throughout the process Urban-Econ, through ECSECC and DEDEAT reported to the National Minister of Rural Development and Land Reform, Mr Gugile Ernest Nkwinti for approval. The final outcome of the process was seen to provide ECSECC and the Provincial Government via DEDEAT with a set of implementable programmes for the promulgation of the new town. Once implemented the project will be the first formalisation of a new town since the onset of democracy in South Africa in 1994.
- NMBM Integrated Public Transport System (IPTS) SMME Strategy: Urban-Econ was appointed by Nelson Mandela Bay Municipality to undertake an SMME Strategy as part of the city's Integrated Public

Transport System. The SMME Strategy seeks to identify areas for the development of small businesses. The study involved the identification of case studies, business opportunity analysis, identifying SMME support services and business packaging.

- DEDEAT Sustainable Energy and Greenhouse Gas Mitigation Initiatives Database: Urban-Econ Development Economists is providing economic and research inputs to a team of service providers updating the provincial Renewable Energy Database on behalf of the Department of Environmental Affairs, Economic Development and Tourism. The project aims to give a consolidated platform for recording and documenting sustainable energy and greenhouse gas mitigation initiatives in the province.
- Mount Fletcher Property Feasibility Study: Urban-Econ Development Economists was appointed by the Elundini Local Municipality to undertake a market research assessment coupled with engineering, town planning, environmental, financial aspects to give guidance in terms of the implementation and roll-out of future property developments in the town of Mount Fletcher.
- Elundini Local Municipality Local Business Enabling Environment: The objective of the study was to examine the Elundini Local Municipality business experience to date and identify models of enabling environment that support business development. Urban-Econ Development Economists was appointed to undertake the study and provide recommendations to improve business investment and retention in the area.
- Regional Economic Profiling for OR Tambo and Joe Gqabi DM: The Eastern Cape Development Corporation (ECDC) commissioned Urban-Econ to undertake a regional economic profiling and socio-economic impact analysis of ECDC Projects. This project comprises two separate studies with different objectives and outcomes. The project is thus approached as two separate studies with their own unique objectives, methodologies and outcomes. The two components were a Regional Economic Profiling Analysis of Specific Sectors in the Eastern Cape, with a particular focus on the O.R. Tambo and Joe Gqabi District Municipalities. An assessment of aquaculture in these districts was undertaken. A Socio-Economic Impact Analysis of Selected ECDC Projects in the O.R. Tambo and Alfred Nzo District Municipalities.
- ECDC Regional Profiles Alfred Nzo and Chris Hani District Municipalities: Urban-Econ Development Economists embarked on a regional economic profiling analysis of the Agriculture and Forestry, Agro-Processing, Aquaculture, Tourism, Automotive, Green Industry, Mining, Information Communication Technology, Business Processing and Outsourcing/ Business Process Services (Services sector) and Petro-Chemical sectors in the Eastern Cape, with a specific look at the identified Districts.
- ECDC PG Bison Investment Impact Assessment: Urban-Econ was appointed by the ECDC to conduct an Economic Impact Analysis of the PG Bison investment in the Ugie/Maclear area. The project modelled the impacts of the infrastructure investments made by the Elundini Local Municipality since 2008 in support of the PG Bison development as well as the Economic Impact of the PG Bison development itself in this same period.
- Eastern Cape Assessment of Potential Limited Payment Machine (LPM) Gross Gambling Revenue (GGR): Urban-Econ was approached to conduct a desktop study to provide a simulation of the potential Gross Gambling Revenue (GGR) for the roll out of Limited Pay-out Machines (LPMs) throughout the Eastern Cape. A model was developed based on secondary data available and assumptions provided through published research into the LPM market.
- iDutywa Precinct Development: Urban-Econ assessed the high-level economic feasibility of various CBD upgrade and precinct development intervention concepts for the town of iDutywa. Urban-Econ then conceptualised business plans for interventions, each considering costing, capital expenditure, income and cash flow projections, as well as financial, economic and social impacts.
- Mthatha Casino Development: Urban-Econ was appointed by African Pioneer (Pty) Ltd who sought to establish a casino in Mthatha. Urban-Econ was required to estimate the Gross Gaming Revenue (GGR) that this casino would generate. As part of this assessment the GGR of the KSD Local Municipality as well as the surrounding areas was estimated. In addition, economic forecasting was conducted to estimate the potential GGR up to 2015
- Alicedale Social Housing Impact Analysis: Urban-Econ was appointed to provide inputs for Public Process Consultants as to the impact of the development of social housing in the town of Alicedale in the Eastern Cape. This involved economic and socio-economic profiling, indicator identification and impact evaluation and reporting

- Impact Assessment of LED Projects within the Amathole District Municipality: Urban-Econ was appointed to undertake a socio-economic impact evaluation for 15 projects in the Amathole District Municipality. This involved the evaluation and rating of projects based on agreed upon economic and socio-economic criteria. Site visits to the project were undertaken to assess the projects and to meet with project co-ordinators. The result of the project is a report to guide the selection, implementation and monitoring of future LED activities in the district
- Tsolo and Qumbu Urban Development Framework: The aim of this project is to provide a comprehensive study of the Tsolo and Qumbu urban nodes in order to develop an Urban Development Framework. The study will include an economic, infrastructural, traffic and transportation, environmental management analyses as well as spatial and land use management. The objective is to provide plans for implementation that will stimulate investment and improve business growth in these towns
- Eastern Cape Government Planning and Capacity Assessment: Urban-Econ was appointed alongside Fort Hare University to undertake a detailed and comprehensive interaction and participation exercise to determine the potential of restructuring the Eastern Cape's provincial planning processes with the idea of creating a centralised planning body. Urban-Econ's role was three fold: 1) a series of engagement sessions were held with high ranking managers and directors within various provincial departments in the Province to gain their input on the existing planning environment in the Province 2) undertake a series of departmental survey's with selected staff members in various departments to assess their opinions with regards to the creation and formation of a new planning body 3) undertake a national and international benchmarking study to better understand centralised provincial planning departments that are operational within other regions/provinces of South Africa and around the world.
- Spitzkop Wind Energy Project Economic Impact Assessment: Urban-Econ was contracted to undertake an economic impact assessment and a community needs analysis for a proposed wind energy project in Makana Local Municipality. This project formed part of the official Environmental Impact Assessment process.
- Caba Cultural Village Feasibility Study: Urban-Econ was appointed by the Mhlontlo Local Municipality to develop a Business Plan for a Cultural Village in Caba. The project involves the development of a feasibility assessment which provides a status quo of the area as well as an analysis of the tourism market. This project is still in its beginning stages, but the objective is to develop a business plan for the implementation of a cultural village that is focussed on job creation, skills development, community empowerment and tourism.
- Chatty Conservation Development Framework: Urban-Econ was commissioned by NMBM to undertake a detailed market research assessment to inform the design of a Conservation Development Framework for the greater Chatty and van der Kemp's Kloof areas in NMBM. The task at hand involved the identification of suitable economic land uses that could be incorporated on the study site and in turn generate suitable income that could be used to achieve the conservation objectives in the area. The market research assessment informed a detailed financial analysis of the carried out for the CDF.
- Eastern Cape Community Residential Units Feasibility Study: Urban-Econ was appointed as part of a project team lead by Bigen Africa by the Eastern Cape Department of Human Settlements to conduct a feasibility study for the development of Community Residential Units (CRU) within eight pilot local municipalities in the Eastern Cape. Urban-Econ's role in the project was to establish the overall demand for CRU housing units within each of the identified municipalities. As part of this process, Urban-Econ was responsible for convening public meetings with identified beneficiaries within each local municipality so as to assist establishing CRU housing demand. Extensive household surveys were also undertaken in each of the pilot municipalities.
- MBDA Economic Impact Assessment: Urban-Econ was appointed by the Mandela Bay Development Agency to conduct Economic Impact Assessments for each of the agency's projects completed to date. The agency wishes to quantify the economic impacts associated with both its infrastructure improvement projects and service orientated projects within its mandate area. As a final deliverable, Urban-Econ EC will provide the MBDA with an Economic Barometer which the agency can use as an information management system for ongoing and future projects. As a result of the project, the agency will be in a position to market itself by publicly quantifying its successes in Nelson Mandela Bay area.
- Eastern Cape Academy of Sports: Urban-Econ was appointed alongside a large team of specialist consultants to develop a provincial sports model for Long Term Athlete development in the Eastern Cape. The outcome of the task involved the design and upgrade of the main provincial academy along

with the various district and regional feeder centres. Urban-Econ's role was that of institutional and operational planning.

- OR Tambo District Municipality Regional Industrial Roadmap: Urban-Econ was part of the Urban-Econ group of companies, which was appointed to conduct the Local Economic Development Capacity Building Programme initiated by the Department of Trade and Industry. The objective is to assist 16 districts across the country to develop credible LED Strategies and capacitate LED Structures. The focus of the project in ORTDM is on providing assistance with an Investors Conference and providing recommendations regarding LED institutional structures in the District.
- Umzimvubu Investment Plan: The project was prepared in response to a request by the Umzimvubu Local Municipality to undertake the development of an Investment Plan to guide implementation of the stimulation, attraction and management of the local economy. It involved analyses of natural resource endowments and a review of the level and quality of available infrastructure and services which form an enabling environment for investment success.
- Strand Street: Environmental Upgrading: A consortium of consultants was appointed by the Mandela Bay Development Agency to propose an environmental upgrading concept for Strand Street in the Nelson Mandela Bay CBD. Urban-Econ EC's role was to conduct research into the status quo of the area and engage with relevant parties to add value to the concept design as well as determine the demand for such an upgrade. The project forms part of the MBDA's inner city regeneration drive.
- Lower Baakens River Valley Re-development: Urban-Econalong with a consortium of consultants was appointed by the Mandela Bay Development Agency to determine the potential for re-development of the Lower Baakens River Valley. Urban-Econ EC's role was to conduct market research to determine the demand for such a re-development and establish what forms of land-use would be best suited to the area. The project forms part of the MBDA's inner city regeneration drive.

Countries of Work Experience:

- South Africa
- Lesotho

References:

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Contact details:

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- Cell Phone: +27 83 470 0088

Thomas Searle Parsons

Date of Birth:	04 July 1985
Profession:	Senior Development Economist
Specialisation:	Local Economic Development (LED) Planning, Strategy Development, Impact Assessments
Years within Firm:	9 Years
Nationality:	RSA
Years of Experience:	9 Years
HDI Status:	White Male

Education:	
Nelson Mandela Metropolitan University (NMMU) - 2004	Bachelor of Commerce (Rationum) majoring in Chartered Accounting and Economics
Nelson Mandela Metropolitan University (NMMU) - 2008	Bachelor of Commerce (Honours) majoring in Economics

Professional Membership:
SAPOA Urban-Econ Development Economists (Pty) Ltd

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

Work Experience:

2009 - Current	Urban-Econ Development Economists

Key Qualification:

Thomas Parsons obtained his B.com Rationum majoring in Chartered Accounting and Economics from the Nelson Mandela Metropolitan University. He went on to obtain his Economics Honours degree with subjects in Micro and Macroeconomics, Public Sector Economics, Development Economics and Investment Analysis. His research thesis was on the effectiveness of inflation targeting. Thomas has developed a variety of business skills, including:

- Economic analysis techniques
- Survey design
- Report writing
- Presentation skills
- Workshop Facilitation
- Local Economic Development Training
- E-Views
- Microsoft Office (Advanced)
- ArcGIS Standard (Elementary user)

Thomas' experience at Urban-Econ includes:

- Conducting socio-economic studies
- Developing of LED Strategies and Plans
- Conducting of Economic Impact Assessments
- Developing and facilitating a training and capacity building programme on Local Economic Development Experience in survey design and implementation
- Development of maps using ArcGIS Standard
- Experience in research

Experience Record:	
Project:	Knysna Integrated Strategic Development Plan (ISDF)
Year:	2013/2014
Location:	Knysna

Client:	**Knysna Local Municipality**
Project Features:	**Urban-Econ Development Economists was part of the successful consortium of Chris Mulder and Associates which were awarded the project to develop an Integrated Strategic Development Plan for the Greater Knysna Municipality. This project entailed the development of a long term development strategy for the municipality which integrated environmental, spatial, economic, housing, infrastructure and town planning elements. Urban-Econ Development Economist's role in the project was the development of an Economic Development Strategy for the Knysna Local Municipality – a specific deliverable for the greater ISDF process.**
Position held:	**Project Economist**
Activities Performed:	**Economic Profiling; Local Economic Development Analysis; Economic forecasting and planning; Public Participation; Strategic Planning.**
Project:	**Mandela Bay Development Agency (MBDA) Economic Barometer**
Year:	**2009 – 2011; 2013 – 2015**
Location:	**Nelson Mandela Bay Metro**
Client:	**MBDA**
Project Features:	**Urban-Econ Development Economists was appointed by the Mandela Bay Development Agency (MBDA) to conduct Economic Impact Assessments for each of the agency's strategic upgrades in the CBD and Central areas of Port Elizabeth. The agency wishes to quantify the economic impacts associated with both its infrastructure improvement projects and service orientated projects within its mandate area. As a final deliverable, Urban-Econ Development Economists provided the MBDA with an Economic Barometer, which the agency can use as an information management system for ongoing and future projects. This was developed by means of a survey that will be conducted annually over the three years of the project. As a result of the project, the agency will be in a position market itself by publicly quantifying its successes in Nelson Mandela Bay area.**
Position held:	**Project Manager**
Activities Performed:	**Economic Profiling; primary Research; Perception surveying; Economic Modelling; Index building; Database development.**
Project:	**Provincial Industrial Development Strategy (PIDS) Implementation Plan**
Year:	**2011**
Location:	**Eastern Cape**
Client:	**Department of Economic Development, Environmental Affairs and Tourism (DEDEAT)**
Project Features:	**Urban-Econ Development Economists was commissioned as part of a consortium of industrial specialists; to project manage and develop an Industrial Implementation Plan for the Eastern Cape, on behalf of the Eastern Cape Department of Economic Development and Environmental Affairs. The aim of the study was to provide an action-orientated implementation plan to implement the existing Eastern Cape Industrial Strategy; as well as to fill information gaps with regards to key sectors in the Eastern Cape. Thus a team of sector specialists in agro-processing, petro-chemicals, automotive, green energy, tourism and capital goods was assembled. Urban-Econ's role was in the overall project management, implementation action framework development and workshop facilitation. The study included the development of a situation analysis for the province, sector potential analysis, opportunity assessment and clustering identification. The outcome of the strategy was an Implementation Framework and Capital Investment Framework.**
Position held:	**Project Economist**
Activities Performed:	**Economic Profiling; Sector Study Research; Strategic Planning; Implementation planning; Monitoring and Evaluation**
Project:	**Social and Sustainability Due Diligence of Aspire Projects**
Year:	**2014**
Location:	**Amathole District Municipality**
Client:	**ASPIRE**
Project Features:	**Urban-Econ Development Economists was appointed by ASPIRE to establish how successful five of their supported/funded projects were at meeting the agency's mandate. The assessment of these five projects focused on determining how sustainable the projects were in terms of value for money, employment creation and**

Position held: Activities Performed:	value addition. Consideration was also give to the broader economic impact that these projects had as well as their value chain linkages. Project Economist Economic Profiling; Economic and socio-economic impact assessment; Project profiling.
Project: Year: Location: Client: Project Features: Position held: Activities Performed:	Thina Sinako Gariep Competitiveness Study 2010 Gariep Local Municipality Gariep Local Municipality Urban-Econ Development Economists partnered with the Gariep Municipality and Umnga Framers Training Association to develop a comprehensive competitive advantage assessment of the Gariep Local Municipality. The aim of the project was to stimulate sustainable economic growth and job creation by identifying and exploiting local competitive and comparative advantage in the Gariep Local Municipality. The project involved a training session in LED processes and competitiveness, an analysis of the local economy in which latent and potential competitive and comparative advantages were identified, the identification of priority sectors for competitive interventions (agriculture including agro-processing and tourism), the profiling of these sectors by means of a value chain assessment, and finally the development of detailed action plans for priority projects that once initiated would enhance the competitiveness of the municipality. Project Economist LED; Economic profiling; Competitiveness assessment; Value chain mapping; Tourism Sector Analysis; Agricultural Sector Analysis; Strategic Planning.

Other Projects:

- The Eastern Cape Socio-Economic Review and Outlook, 2015: The Eastern Cape Department of Economic Development, Environmental Affairs and Tourism (DEDEAT) in collaboration with the Eastern Cape Provincial Treasury appointed Urban-Econ Development Economists to undertake the compilation of a Provincial Socio-Economic Profile and Outlook for 2015. The annual reports provides timeous, reliable information on the socio-economic outlook of the Eastern Cape providing an overview of the past performance of the economy, within the wider context of the performance of the South African economy.
- ECDC Amathole and Cacadu profiling: Urban-Econ was appointed by the Eastern Cape Development Corporation (ECDC) to undertake economic profiling of the Amathole and Sarah Baartman District Municipalities. The economic profiling entails analysing the potential of economic sectors in both district municipalities, the performance of these sectors in the past year and their importance to the economy of the district municipalities. The economic profiling is vital in seeing in which direction the district municipalities should be heading to ensure economic growth.
- Amathole District Municipality Impact Assessment: Urban-Econ Development Economists was appointed to undertake a socio-economic impact evaluation for 15 projects in the Amathole District Municipality. This involved the evaluation and rating of projects based on agreed upon economic and socio-economic criteria. Site visits to the project were undertaken to assess the projects and to meet with project co-ordinators. The result of the project is a report to guide the selection, implementation and monitoring of future LED activities in the district.
- Amathole District Municipality – Local Municipalities Capacity Building Programme for LED: The Amathole District Municipality (ADM) local municipalities Capacity Building Programme entailed the development of a training manual on LED processes and concepts including economic assessments, strategic planning and partnerships, implementing LED and monitoring and evaluation of LED.
- Regional Economic Profiling for OR Tambo and Joe Gqabi District Municipalities: The Eastern Cape Development Corporation (ECDC) commissioned Urban-Econ Development Economists to undertake a regional economic profiling and socio-economic impact analysis of ECDC Projects. This project comprises two separate studies with different objectives and outcomes. The project is thus approached

as two separate studies with their own unique objectives, methodologies and outcomes. The two components were a Regional Economic Profiling Analysis of Specific Sectors in the Eastern Cape, with a particular focus on the O.R. Tambo and Joe Gqabi District Municipalities. An assessment of aquaculture in these districts was undertaken, a Socio-Economic Impact Analysis of Selected ECDC Projects in the O.R. Tambo and Alfred Nzo District Municipalities.

- Bloukrans Filling Station: Urban-Econ Development Economists was appointed to undertake a specialist economic study to assess the capacity of the market to sustain a new filling station on the N2 near Bloukrans Bridge, Eastern Cape. It is understood that the need for market research is required to inform investment decisions and provide guidelines in terms of the demand for petrol and diesel as well as the auxiliary uses that will support the filling station.
- Butterworth Hospital study: Urban-Econ Development Economists was appointed by Ditlou Consulting Engineers to provide market research to inform a hospital development in Butterworth, Eastern Cape. The research was aimed at providing information to substantiate the demand for a hospital facility.
- Socio-Economic Impact of selected ECDC Projects in the Amathole District: Urban-Econ Development Economists was commissioned by the ECDC to undertake a socio-economic impact assessment of three ECDC supported projects in order to establish how successful these development projects were at meeting the ECDC mandate. Included in this assessment was a broad spectrum analysis of the Eastern Cape priority industrial sectors in order to contextualise the ECDC project interventions.
- Spitskop Wind Energy Facility: Urban-Econ Development Economists was contracted to undertake an economic impact assessment and a community needs analysis for a proposed Wind energy project in Makana and Blue Crane Route Local Municipalities. This project formed part of the official Environmental Impact Assessment process. This report was updated in 2014 to include the economic impact of several transmission line routes.
- Senqu Tourism Plan: Urban-Econ Development Economists undertook the development of a Responsible Tourism Plan for the Senqu Municipality on behalf of the local municipality. The plan was aligned to previous detailed plans of tourism positioning within an alpine region and considered the institutional arrangements for the implementation of Tourism in the Municipality. The objective of the Responsible Tourism Plan was to identify exiting potential and identify appropriate interventions to promote and develop the tourism industry in the Senqu Local Municipality.
- Mthatha Casino Development: Urban-Econ Development Economists was appointed by African Pioneer (Pty) Ltd who sought to establish a casino in Mthatha. Urban-Econ Development Economists was required to estimate the Gross Gaming Revenue (GGR) that this casino would generate. As part of this assessment the GGR of the King SabataDalindyebo Local Municipality as well as the surrounding areas was estimated. In addition, economic forecasting was conducted to estimate the potential GGR up to 2015.
- Zwide Retail Assessment: Urban-Econ Development Economists has been appointed to undertake a desktop Retail Market Research Study to assess the capacity of the Nelson Mandela Bay Metro (NMBM) to sustain a new shopping centre in Zwide, with a Shoprite store as the anchor tenant. The purpose of this study is to determine the extent and nature of the demand for retail space in the area, based on the prevailing demographic and economic conditions of the study area. The aim of this report was to provide an objective assessment of the retail market potential within the study area as well as the impact of growth and the influence it will have on future demand for a retail facility.
- Joe Gqabi LED Strategy: Urban-Econ Development Economists Cape was appointed by the Eastern Cape Provincial Department of Local Government and Traditional Affairs to develop a Local Economic Development Strategy for the Joe Gqabi District. The project outcomes include conducting LED training with LED officials and local stakeholders and developing an updated situation analysis profile. The process of developing the LED strategy concentrates on public participation and an inclusive approach to develop the economic vision of the region. The strategy was also aligned to existing

strategies such as the GDS agreement and the Sustainable Development Strategy that concentrated on the economic development of the region whilst protecting the integrity of the natural resources.

- Gariep LED Plan: The development of the Gariep LED Plan involved the development of a situation analysis report which provided a status quo of the Gariep Local Municipality located in the Joe Gqabi District Municipality. The other output of the project was an implementation framework which proposed specific catalytic projects, that if implemented would promote the achievement of Gariep's economic objectives. The project also entailed two economic indabas where inputs where obtained from a diverse range of stakeholder.
- Feasibility Studies for CRU Projects: Urban-Econ Development Economists was appointed by Bigen Africa to undertake an assessment for the demand for CRU Housing units within selected local municipalities in the Eastern Cape. This entailed desktop research as well as site visits to the affected local municipalities.
- Cacadu Investment Information Portal: The development of the Cacadu Investment Information Portal focused on the packaging of information relating to investment opportunities within the strategic focus areas of the Cacadu District Municipality. These strategic focus areas are agriculture, manufacturing (predominantly linked to agro-processing opportunities), tourism, and SMME development. The packaged investment opportunities will allow the Economic Development Department of the Cacadu District to populate the Trade and Investment Information Portal located on their website.
- Strategic Competitive Advantage Action Plan for the Gariep Local Municipality: The aim of the project is to stimulate sustainable economic growth and job creation by identifying and exploiting local competitive and comparative advantage in the Gariep Local Municipality. The project involved a training session in LED processes and competitiveness. The project also entailed the development of value chains for priority sectors in Gariep including: agriculture (particularly agro-processing), tourism, and government services.
- Flamingo Estate - Residential Market Research: Urban-Econ Development Economists was appointed by the Newco Consortium to conduct residential market research and compile a specialist market study for the Flamingo Estate residential development, a proposed sustainable integrated housing project, near Redhouse in the Nelson Mandela Bay Municipality (NMBM). The project also entailed modelling the potential housing demand in the NMBM.

Countries of Work Experience:

- South Africa

References:

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Annexure 2: Data Collection Tools and List of Interviews Conducted

LAND USE SURVEY

Questionnaire Number: _____

INSTRUCTIONS:

- **The contents of this questionnaire to be kept strictly confidential**
- **Please use capital letters.**
- **Unless otherwise specified, circle all answers.**
- **Provide answers only in the shaded areas.**

INTERVIEWER:

	NAME	CONTACT NUMBER
Name of interviewer		
Name of interviewee		

PART 1: GENERAL INFORMATION

1.1. What is the size of your farm/property in hectares?

1.2. Is the property used for farming purposes?

Yes	1
No	2

1.3 If no, what is the property used for? _____

1.4 If yes, for what type of farming

Commercial farming	1
Communal farming	2
Not applicable	3

1.5 What primary type of farming activity that occurs on your farm?

Livestock (beef)	1
Livestock (dairy)	2
Livestock (pigs)	3
Poultry (including egg production)	4
Dryland crops (including horticulture)	5
Irrigated pastures	6
Other (please specify)	7
Not applicable	8

1.6 Please indicate the type of residence the property is used for?

Permanent residence	1
Leisure/occasional residence	2
Not applicable	3

PART 2: RESIDENCY INFORMATION

2.1. How many adults (aged 15 to 65) are employed on the farm per gender?

Permanent		Temporary	
Males	**Female**	**Males**	**Female**

2.1 What is the average duration of temporary employment?

2.1. How many people permanently live on the farm (excluding labourers)

2.2 Do the labourers live on the farm?

Yes	1
No	2

2.3 If yes how many of the labourers?

2.4 If no, where do they live?

2.5 Do family members of the labourers live on the farm?

Yes	1
No	2

2.6 If yes, how many?

2.7 If no, in which area does the family members live?

PART 3: FARMING OPERATIONS

3.1 What is the extent of your commercial activities?

Activity	Area (ha)	Livestock numbers/Annual yields
Livestock (beef)		
Livestock (dairy)		
Livestock (pigs)		
Poultry (including egg production)		
Dryland crops (including horticulture)		
Irrigated pastures		
Other (please specify)		

3.2 Which of the above activities are the main source(s) of your income?

PART 4: ADDITIONAL COMMENTS

4.1 Do you have any additional thoughts/comments that you wish to share about the proposed development (e.g. change in farming activities or employment because of the development)? Explain.

TOURISM SURVEY

1. Specific to a tourism facility:

- What kind of services does your tourism facility offer?
- How many beds does it contain?
- Who generally stays at your facility? (e.g. families, couples, groups, etc.)
- Where do your visitors general come from? (domestic or international visitors)
- For what purpose do people usually stay?
- How many people/heads do you accommodate on an annual basis?
- Do you experience seasonality in visitation by tourists throughout the year? When is the peak season for you?
- Do you foresee the project to impact positively or negatively on your business?
- To which extent will the impact be positive or negative?
- Do you have any concerns?
- What would you prefer the develop to do to address these concerns?

Table 1: List of Interviews Conducted

Person Contacted	Relationship to Development	Type of engagement	Contact date
Johan Marais	Property Owner – Jeffrey's Bay Wind Farm	Telephonic interview	28.01.19
Elize Kommer	Property Owner – Gibson Bay Wind Farm	Telephonic interview	29.01.19
Oloff Cilliers	Property Owner – Kouga Bay Wind Farm	Telephonic interview	29.01.19
Eddie Albertyn	Local Conveyancer - Humansdorp	Telephonic interview	06.02.19
Shirely Godwell	Local Estate Agent - Humansdorp	Telephonic interview	06.02.19
Hanti van der Westhuisen	Manager: St. Francis Bay, Humansdorp and Oyster Bay Tourism Association	Telephonic interview	06.02.19
Rufus Dreyer	Property Owner	Telephonic interview	26.11.18
Sakkie van der Merwe	Property Owner	Telephonic interview	26.11.18
S. Steynberg	Property Owner	Telephonic interview	27.11.18
Justin Muller	Property Owner	Telephonic interview	27.11.18

Albie Schereduer	Property Owner	Telephonic interview	29.11.18
Hannes Cilliers	Property Owner	Telephonic interview	22.01.19
Theresa Bothma	Property Owner	Telephonic interview	22.01.19
Bonnen Biggs	Property Owner	Telephonic interview	22.01.19
Vernon Basson	Property Owner	Telephonic interview	23.01.19
Wilhelm Mayer	Property Owner	Telephonic interview	24.01.19

Annexure 3: Declaration of Independence

environmental affairs
Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

DETAILS OF SPECIALIST AND DECLARATION OF INTEREST

	(For official use only)
File Reference Number:	12/12/20/ or 12/9/11/L
NEAS Reference Number:	DEA/EIA
Date Received:	

Application for integrated environmental authorisation and waste management licence in terms of the-

(1) National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended and the Environmental Impact Assessment Regulations, 2014; and

(2) National Environmental Management Act: Waste Act, 2008 (Act No. 59 of 2008) and Government Notice 921, 2013

PROJECT TITLE

IMPOFU EAST WIND FARM – IMPACT ASSESSMENT REPORT

Specialist:	**Socio-Economic**		
Contact person:	**Mr Matthew Keeley**		
Postal address:	**127 Cape Road; Mount Croix**		
Postal code:	**6001**	Cell:	
Telephone:	**041 585 6640**	Fax:	
E-mail:	**ec@urban-econ.com**		
Professional affiliation(s) (if any)	**-**		

Project Consultant:	**Aurecon South Africa (Pty) Ltd**		
Contact person:	**Mrs Kirsten Jones**		
Postal address:	**PO Box 494, Cape Town**		
Postal code:	**8000**	Cell:	**-**
Telephone:	**021 526 6991**		**-**
E-mail:	**Kirsten.jones@aurecongroup.com**		

4.2 The specialist appointed in terms of the Regulations_

I, Matthew Keeler declare that -- General declaration:

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

Signature of the specialist:

Urban-Econ Development Economists

Name of company (if applicable):

22/03/2018

Date: