



REPORT

Social Impact Assessment for the Dalmanutha Wind Energy Facilities, Belfast, Mpumalanga

Environmental Impact Assessment and Water Use Licence Application

Submitted to:

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TABLE OF ABBREVIATIONS

EHS	Environmental, Health and Safety
EIA	Environmental Impact Assessments
ESMP	Environmental and Social Management Plan
IDP	Integrated Development Plan
IFC	International Financing Corporation
MTS	Main Transmission Station
NDM	Nkangala District Municipality
REIPPPP	Renewable Energy Independent Power Producer Procurement Programme
SIA	Social Impact Assessment
WEF	Wind energy facilities
CSIR	Council for Scientific and Industrial Research
ESIA	Environmental and Social Impact Assessment
IPP	Independent Power Producers
NEMA	National Environmental Management Act
NGO	Non-Governmental Organisation
TVET	Technical and Vocational Education and Training
REDZ	Renewable Energy Development Zones

1.0 INTRODUCTION

ENERTRAG South Africa (Pty) Ltd has commissioned Golder, a member of WSP, to undertake the environmental permitting processes required for the two wind energy facilities (WEF) located near Belfast in Mpumalanga. The WEF are named Dalmanutha Wind and Dalmanutha West. The following sections provide the terms of reference and the legislative requirements for this Social Impact Assessment (SIA).

1.1 Terms of reference

ENERTRAG has appointed Golder a member of WSP to undertake Environmental Impact Assessments (EIA) for the projects in line with the National Environmental Management Act 107 of 1998 (NEMA) [EIA Regulations (2014 as amended)] and the International Financing Corporation (IFC) Guidelines. As part of the process a Social Impact Assessment (SIA) is required. The SIA will:

- Describe the socio-economic conditions of the receiving environment.
- Identify and describe the socio-economic implications associated with the proposed project.
- Identify, describe, and rate the significance of the socio-economic impacts that may result from the proposed project.
- Recommend feasible (practical and cost effective) mitigation measures to enhance positive effects and reduce negative impacts.

2.0 PROJECT DESCRIPTION

The proposed Dalmanutha complex includes two wind farms. Every WEF will have one substation and one power line (up to 132 kV). The two power lines of the WEF will be connected to a shared substation in the development area of the Dalmanutha Wind WEF. Each sub-project will be more fully described in the subsection below.

2.1 PROJECT LOCATION

Dalmanutha is situated in Mpumalanga Province, South Africa and it is 16 km east of Belfast, on the route between Pretoria and Maputo. It falls under Emakhazeni Local Municipality which is situated between two major towns in the province, namely Middelburg and Nelspruit. The project is connected to both these centres via the N4 Freeway. The development area is blanketed with numerous coal prospecting and mining rights. The existing mining rights are shown in Figure 1, and Figure 2 shows the three project sites. The project site was selected due to its proximity to Gumeni Main Transmission Station (MTS), which will have sufficient capacity to allow the project to connect to it. Thus, this project site has ideal grid connection potential as the project will connect to the existing Gumeni MTS, which is located approximately 17.5km from the proposed project site. Figure 2 outlines the location for the three projects, Dalmanutha Wind and Dalmanutha West.

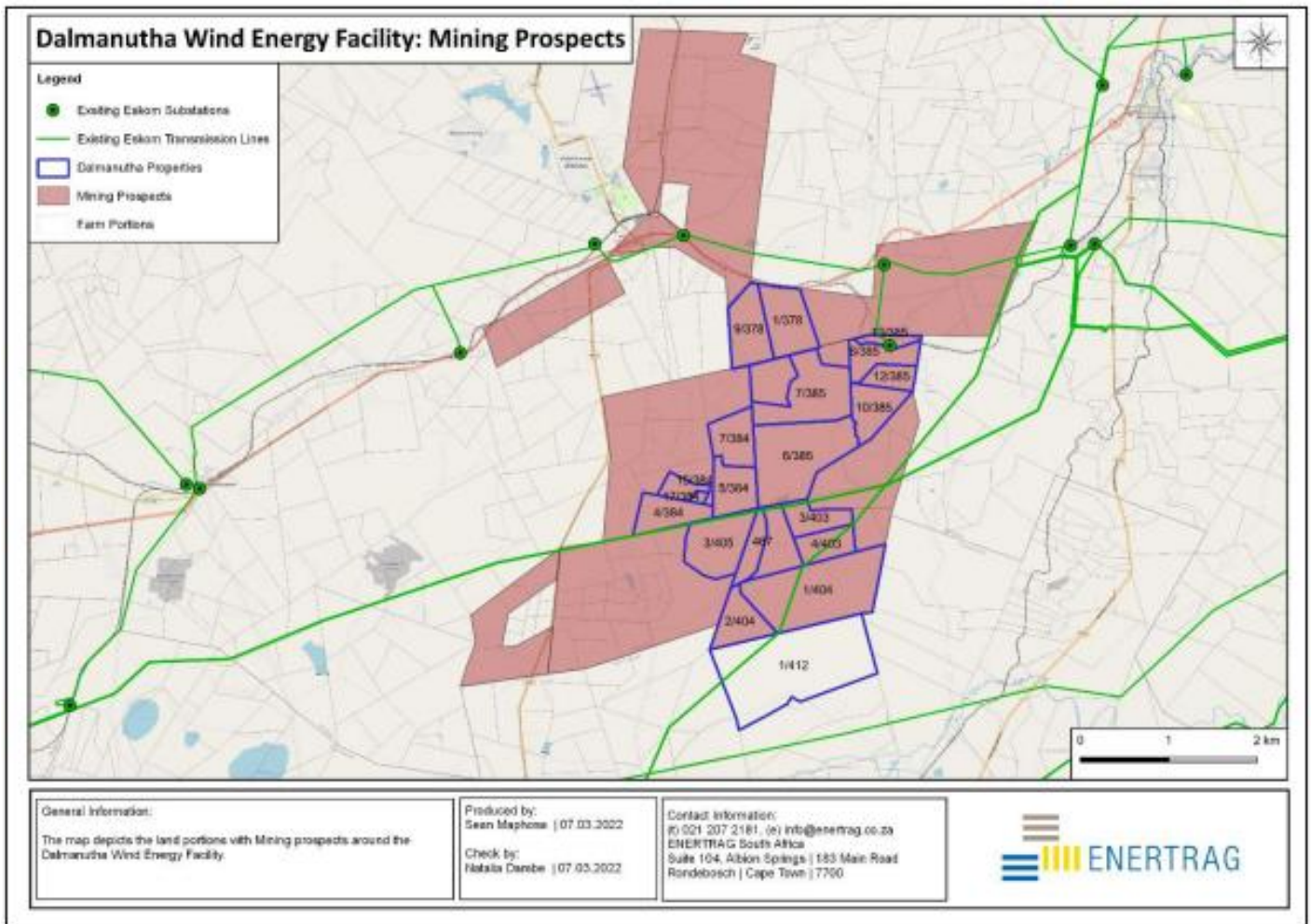


Figure 1: Mining prospects around the proposed Projects Site.

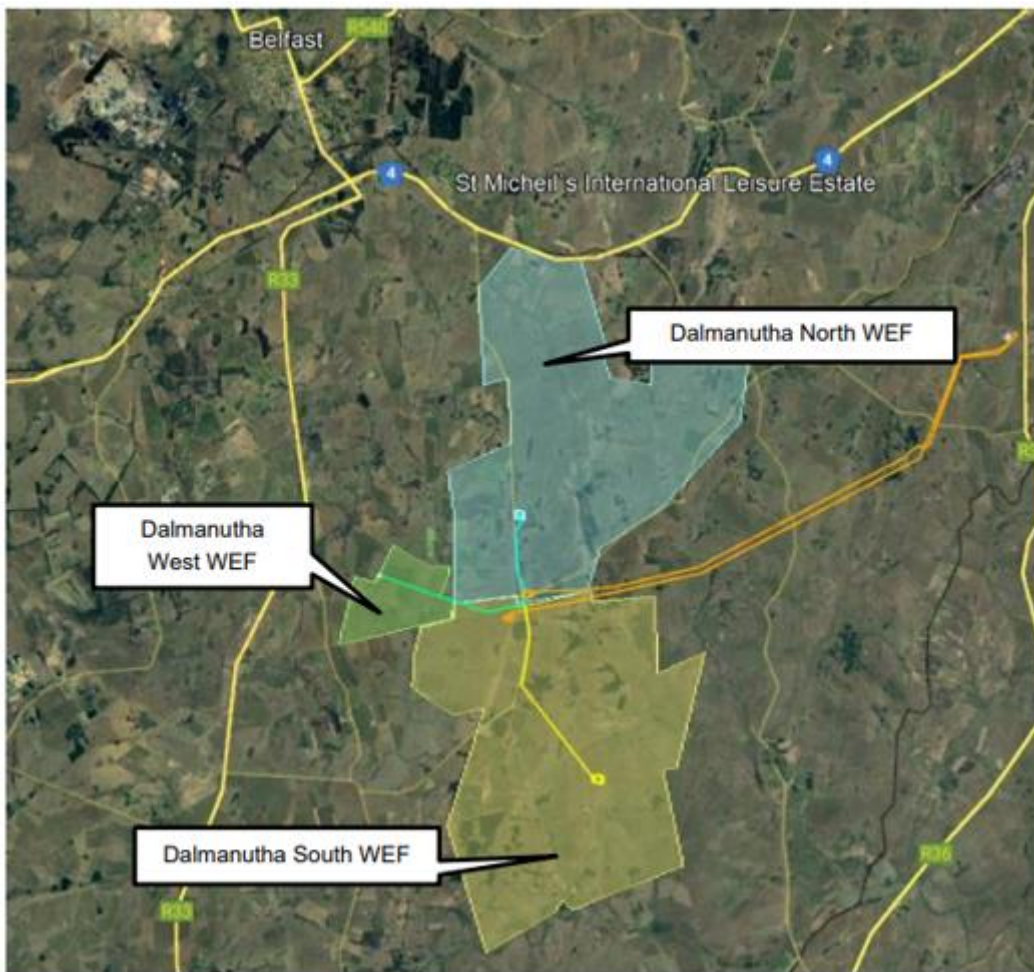


Figure 2: Map showing project sites: Dalmanutha North, Dalmanutha West and Dalmanutha South

- **Dalmanutha Wind**

The Dalmanutha Wind Energy Facility is located approximately 7km southeast of the Belfast town. Site access is via the N4. Dalmanutha Wind will be located over eighteen farm portions covering approximately 9293 ha. Dalmanutha Wind will have an onsite (Independent Power Producer) IPP substation and a 12km up to 132kV powerline. Project details for Dalmanutha Wind are detailed in Table 1.

- **Dalmanutha West**

The proposed Dalmanutha West Wind Energy Facility (Dalmanutha West) is located approximately 12km south-southeast of Belfast town, adjacent to Dalmanutha Wind. Site access is via the R33, about 2.14km from the proposed development area. The site is located over three farm portions covering approximately 475ha and will have an onsite IPP substation and a 10km up to 132kV powerline as can be seen in Table 1.

Table 1: Project Summary

Specifications	Dalmanutha Wind	Dalmanutha West
Nearest Town	Approx. 7km southeast of Belfast	Approx. 12km southeast of Belfast
Total project Area	9400ha	580ha

Specifications	Dalmanutha Wind	Dalmanutha West
Construction footprint	Approx. 200ha	Approx. 15ha
Wind Turbines	Up to 35	Approx. 15ha
WEF capacity	Up to 150MW	Up to 20MW
Hub Height	Up to 200m	
Rotor Diameter	Up to 200m	
Powerline	Up to 132kV	
Powerline length	Approx. 15km	
Onsite Substation footprint including battery energy storage system (BESS)	Up to 6ha	Up to 2ha
Eskom substation expansion footprint	Up to 1ha	
BESS Capacity	100MW/400MWh	10MW/40MWh

3.0 SOCIAL IMPACT METHODOLOGY

3.1 Methodology

3.1.1 Desktop review

Golder, a member of the WSP Group, reviewed available documents to obtain information regarding the socio-economic conditions in the study area. The documents reviewed include the following:

- Integrated Development Plans (IDPs). [1]
- Socio-economic and demographic statistics. [2]
- Documents concerning the proposed project, which include a project description document. [3]
- Available maps and satellite imagery.

4.0 LEGISLATIVE CONTEXT

4.1 The constitution of South Africa

Table 2: Aspects of the South African Constitution applicable to SIA

Legislation	Description
Section 24 of the Constitution	Everyone has the right <ul style="list-style-type: none"> a. to an environment that is not harmful to their health or wellbeing; and

Legislation	Description
	<ul style="list-style-type: none"> b. to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that <ul style="list-style-type: none"> i. prevents pollution and ecological degradation. ii. promote conservation. iii. secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.
Section 25 of the Constitution	<p>(1) No one may be deprived of property except in terms of the law of general application, and no law may permit arbitrary deprivation of property.</p> <p>(2) Property may be expropriated only in terms of general application</p> <p>(a) for a public purpose or in the public interest; and</p> <p>(b) subject to compensation, the amount of which and the time and manner of payment of which have either been agreed by those affected or decided or approved by a court.</p> <p>(6) A person or community whose land tenure is legally insecure due to past racially discriminatory laws or practices is entitled to the extent provided by an act of Parliament, either to legally secure tenure or to comparable redress."</p>

4.2 National Environmental Management Act, 1998 (NEMA)

According to NEMA, sustainable development requires the integration of social, economic, and environmental factors in the planning, implementation, and evaluation of decisions to ensure that development serves present and future generations.

4.3 The National Spatial Development Perspective

According to the National Spatial Development Perspective, spatial development should, where appropriate, accommodate and promote private economic ventures, which can aid sustainable economic growth, relieve poverty, increase social investment, and improve service delivery. Consequently, municipal-level spatial planning has been considered where possible.

4.4 The National Water Act No. 36 of 1998

The National Water Act (No. 36 of 1998) (NWA) governs the protection of water resources and water use. Section 21 of the Act identifies certain land uses, infrastructure developments, water supply or demand and waste disposal as water uses that require authorisation by the Department of Water and Sanitation (DWS). Water use is defined broadly in the NWA, and includes taking and storing water, activities which reduce stream flow, waste discharges and disposals, controlled activities (activities which impact detrimentally on a water resource), altering the bed, banks, course or characteristics of a watercourse, removing water found underground for certain purposes, and recreation. In general, a water use must be licensed unless it is listed in

Schedule 1, is an existing lawful use, is permissible under a general authorisation, or if a responsible authority waives the need for a licence.

4.5 The Biodiversity Act No 10 of 2004

The sensitive biodiversity areas within the municipal jurisdiction were identified in 2009 during the development of an Environmental Management Framework for the municipality. Global warming and climate change is a reality and government has since taken measures to raise awareness on climate change. As Emakhazeni Local Municipality, the need for the development of the climate change response strategy has been identified together with having more awareness campaigns to reach as many citizens as possible.

4.6 National Environmental Management: Waste Act, 2008 (No.59 of 2008)

Act to reform the law regulating waste management in order to protect health and the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development.

The municipality is in the process of investigating the possibility of waste to energy solutions through private service providers in order to lessen our carbon footprint. The Air Pollution and Waste Acts also prescribe that designated personnel be allocated these responsibilities. At this stage, the Environmental Management unit currently relies on one personnel member to deal with environmental and waste management issues [4].

4.7 International guidelines and standards

This study has considered the requirements of the International Finance Corporation Performance Standards (IFC PS). The IFC PSs (and associated guidance notes) provide guidance on identification of impacts and the related risks, as well as mitigation of these risks, to develop a project in a sustainable manner.

Over time, the IFC PS developed into an environmental and social risk management framework used internationally by financial institutions.

Table 3 presents an assessment of the project against the IFC performance standards.

Table 3: IFC performance standards

Performance Standard	PS Objective	Relevance to the project	Note
PS1: Assessment and management of environmental and social risks and impacts	To identify and evaluate social risks and project impacts To adopt mitigation hierarchy To promote improved environmental and social performance To address grievances from affected communities To promote and provide ways for adequate (stakeholder) engagement	Yes	The ESIA has been undertaken to identify and evaluate environmental and social risks and impacts of the proposed project. An Environmental and Social Management Plan will be formulated and tailored to the project to stipulate mitigation measures to manage adverse social impacts identified in the ESIA

Performance Standard	PS Objective	Relevance to the project	Note
PS2: Labour and working conditions	<p>To promote the fair treatment, non-discrimination and equal opportunity of workers</p> <p>To establish, maintain and improve the worker-management relationship</p> <p>To promote compliance with national employment and labour laws</p> <p>To protect workers, including vulnerable categories of workers such as children, migrant workers, workers engaged by third parties and workers in the client's supply chain</p> <p>To promote safe and healthy working conditions, and the health of workers</p> <p>To avoid the use of forced labour</p>	Yes	ENERTRAG, through the appointment of contractors, will create employment opportunities during the project's Construction and Operations phases
PS4: Community health, safety and security	<p>To anticipate and avoid adverse impacts on the health and safety of the Affected Community during the project life from both routine and non-routine circumstances</p> <p>To ensure that the safeguarding of personnel and property is carried out in accordance with relevant human rights principles and in a manner that avoids or minimises risks to the affected communities</p>	Yes	<p>The key PS4 impacts are as follows:</p> <p>— Lower risk PS4 considerations include the risk of electrocution and potential electromagnetic fields exposure, appropriate safety and security measures will need to be implemented for all the project sites - the location of the powerlines outside of the security perimeter of the project sites results in potential risk of electrocution and potential electromagnetic fields exposure.</p> <p>These risks will be qualitatively evaluated in the environmental and social assessment and the clients' standard safety and security measures, as well as potential additional measures recommended by WSP, and will be detailed in the EMPr.</p>

Performance Standard	PS Objective	Relevance to the project	Note
PS5: Land acquisition and involuntary resettlement	<p>To avoid, and when avoidance is not possible, to minimise displacement by exploring alternative project designs</p> <p>To avoid forced eviction</p> <p>To anticipate and avoid, or where avoidance is not possible, to minimise adverse social and economic impacts from land acquisition or restrictions on land use by (i) providing compensation for loss of assets at replacement cost and (ii) ensuring that resettlement activities are implemented with appropriate disclosure of information, consultation and the informed participation of those affected</p> <p>To improve or restore the livelihoods and standards of living of displaced persons</p> <p>To improve living conditions among physically displaced persons through the provision of adequate housing with security of tenure at resettlement sites</p> <p>To identify risks associated with resettlement transactions.</p> <p>To recommend land-based resettlement strategies for physically and economically displaced households whose livelihoods have been land-based.</p>	No	initial observation of the land use suggests that no physical or economic displacement or livelihood restoration will be required. This will be confirmed during the reconnaissance site visits.
PS7: Indigenous peoples	To ensure that the development process fosters full respect for the human rights, dignity, aspirations, culture and natural resource-based livelihoods of indigenous peoples	No	There are no indigenous peoples as defined by the IFC PS in the project area.
PS8: Cultural Heritage		Yes	Cultural heritage characteristics (or lack thereof) associated with the site will be

Performance Standard	PS Objective	Relevance to the project	Note
			explicitly confirmed within the ESIA process. Under South African legislation the development of site of more than 5000 square meters is regarded as having the potential to impact heritage resources and a Heritage Impact Assessment is required.

5.0 SOCIAL BASELINE

On 16 February 2018, the DEA gazetted the Renewable Energy Development Zones (REDZ) and strategic transmission corridors and procedures for the assessment of large-scale wind and solar photovoltaic energy development activities (GN 114) and grid infrastructure (GN 113). Subsequently, on 26 February 2021 a further three REDZ were gazetted (GN 142). The procedure allows for wind and solar PV activities within the eight REDZs and electricity grid expansion within the five power corridors to be subjected to a BA and not a full S&EIA process. In addition, the timeframes associated with the decision on the application is reduced from 107 days to 57 days. From the information provided regarding the location of the projects, the closest REDZ is the newly gazetted Emalahleni REDZ 9, however the proposed projects are not located within a REDZ (Figure 3). Furthermore, the closest strategic transmission corridor is the international corridor, however, the proposed projects are also not located within this corridor (Figure 3) [3].

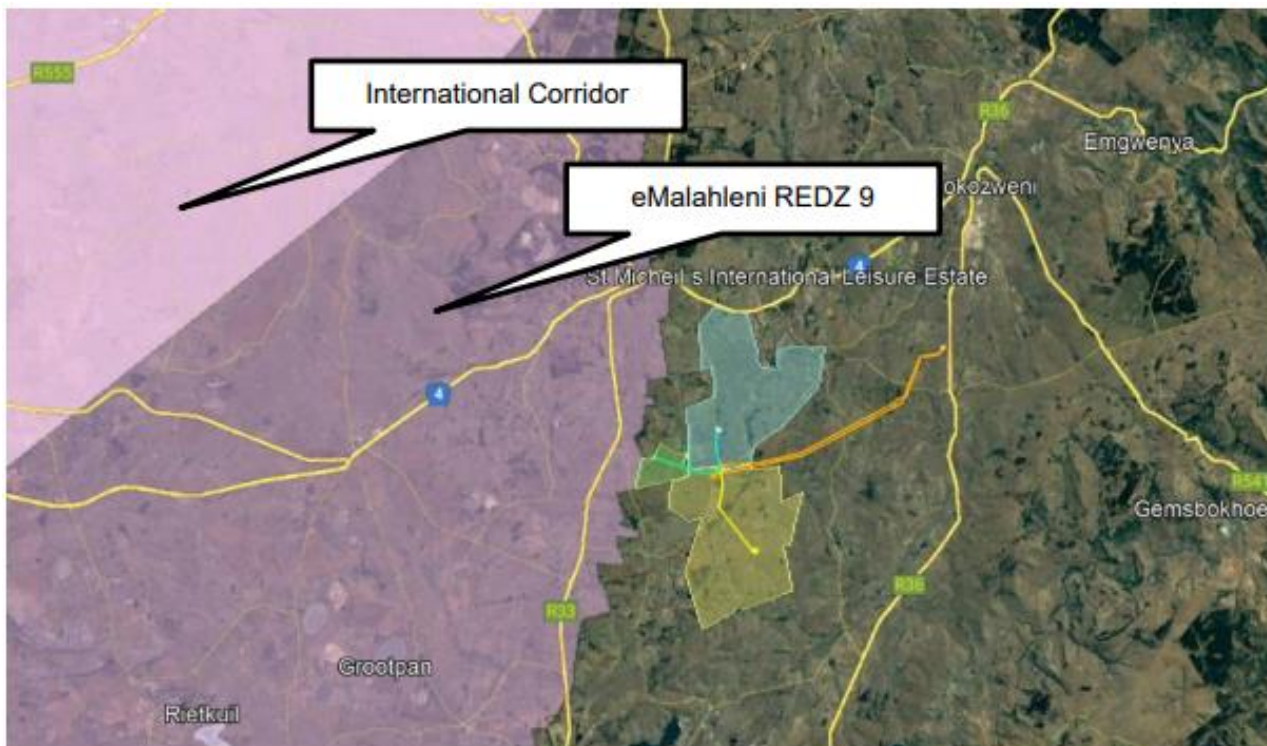


Figure 3: Proposed Projects in relation to the new Emalahleni REDZ 9 and International Corridor [3]

The project will greatly contribute to the countries' efforts to reduce their carbon emissions and play their role as part of the Paris Climate Accord. The Paris Agreement is a legally binding international treaty signed by 196 countries at the COP 21 in Paris, on the 12th of December 2015 to combat climate change. The goal of the Paris Accord is to limit global warming to well below 2 degrees Celsius, compared to industrial levels to avoid catastrophic natural disasters which are driven by the global temperature increase. Therefore, to achieve this long-term temperature goal, countries aim to reach global peaking of greenhouse gas emissions as soon as possible to achieve a climate-neutral world by 2050 [1].

Failure to do so, will result in catastrophic impacts on both the global and local communities, as it is predicted that as climate change increases, this would have a significant negative impact on agriculture. Studies have shown that climate change including the drastic increases in the frequency and intensity of extremes events, have reduced food and water security, hindering efforts to meet Sustainable Development Goals. In Mpumalanga, majority of the farmers rely on maize, soya bean and cattle rearing as their primary sources of income. As the current climate change trends continue, this leaves them vulnerable to the possible 24% decrease in their maize yields, and a significant decrease in their bean yields as well [1].

The project essentially gives farmers, alternative sources of income, without causing damage to their agricultural lands. Wind facilities allow for multiple land uses the farmers can grow their crops around the turbines and also let their animals graze freely without disruption. This gives them more financial security should the impacts of climate change continue to disrupt their harvests.

Coal burning power station release pollution into the atmosphere which are hazardous to human health should they be exposed to these over long periods of time. Wind energy provides a cleaner option as it does not emit hazardous compounds into the air.

The surrounding landscape has a rolling hill topography which is suitable for the development of a wind project. The Projects site itself is located on a flat high lying landscape that has the highest wind resource within the immediate area. The Projects site can be accessed easily via either the tarred R33 or the R36 national roads which run along the northern and western boundaries of the site. There is an existing road that goes through the land parcels to allow for direct access to the project development area. There is minimal competition in the area, with regards to renewable energy facilities; thus, the Project will likely be the first wind farm in the Belfast area and will act as one of the pioneering developments and open opportunities for other renewable developments [1]

5.1 Mpumalanga Province

Mpumalanga Province is located in the north-eastern part of South Africa. The province borders two of South Africa's neighbouring countries viz. Mozambique and Swaziland; and five other South African provinces, namely, Gauteng, Limpopo, KwaZulu-Natal and Free State Provinces. Mpumalanga is characterised by the high plateau grasslands of the Middleveld, which roll eastwards for hundreds of kilometres. It rises towards mountain peaks in the northeast and terminates in an immense escarpment¹.

Mpumalanga Province covers an area of 76 495km² and has a population of approximately 4 335 965 [1]. The capital city of Mpumalanga is Mbombela (previously Nelspruit), and other major cities and towns include Emalahleni (formerly Witbank), Standerton, eMkhondo (previously Piet Retief), Malelane, Ermelo, Barberton and Sabie. The province is divided into three district municipalities: Gert Sibande, Ehlanzeni and Nkangala Districts. These three districts are further subdivided into 17 Local Municipalities. The proposed development

¹www.municipalities.co.za

falls within the Emakhazeni Local Municipality. The Emakhazeni Local Municipality falls under the Nkangala District Municipality (NDM).

5.2 Nkangala District Municipality

The NDM is a Category C² municipality in the Mpumalanga Province. It is one of three district municipalities in the province, making up 22% of its geographical area. The NDM comprises the Victor Khanye, Emalahleni, Steve Tshwete, Emakhazeni, Thembisile Hani, and Dr JS Moroka local municipalities [1]. The NDM is headquartered in Middelburg. The NDM is the economic hub of Mpumalanga and is rich in minerals and natural resources. The NDM is host to the Maputo corridor, bringing increased economic growth and tourism development potential³.

5.3 Emakhazeni Local Municipality

The Emakhazeni Local Municipality is strategically located between Pretoria/Johannesburg complex in Gauteng and Nelspruit in Mpumalanga. It is bordered to the north by The Greater Groblersdal and Thaba-Chweu Local Municipalities, forming part of the Limpopo Province and Ehlanzeni District Municipality. Emakhazeni is the gateway to the major tourist attraction points in Mpumalanga and the eastern parts of Limpopo Province. The N4 and Road P81-1 provide links from Gauteng to the major tourism centres in Mpumalanga, specifically the Kruger National Park to the east and Pilgrim's Rest, Graskop, Lydenburg and Hoedspruit to the north-east [4].

National Development Plan

The objective of the NDP relates to the implementation of public employment programmes, with which the municipality aligns to through its Expanded Public Works Programme (EPWP) and the Community Works Programme (CWP) implementation. The municipality also has close working relations with the social partners in ensuring that the locals are prioritized through employment when implementing capital programmes.

Government Outcomes

Cabinet adopted 12 Outcomes within which to frame public-service delivery priorities. Cabinet Ministers accordingly signed Performance Agreements linked to these Outcomes. More detailed delivery Agreements have since been developed to extend targets and responsibilities to National and Provincial Departments, Agencies and Municipalities. Outcome 10 addresses protection and enhancement of environment assets and natural resources. ELM has an Environmental Management Framework in reduce greenhouse gas emission, mitigate climate change impacts and improve air quality [1].

5.3.1 Population size and composition

Emakhazeni Local Municipality's population increased by 0.4% (47 216 – 48 149) from 2011 to 2016. The total number of households grew from 13 722 in 2011 to 14 633 in 2016, contributing to 3.5% of the number of households in Nkangala (Table 4). The youth population grew by 1.6% per annum between 2011 and 2016 and forms 39.6% of the total population. Table 4 shows population and household numbers from 2011 to 2019 and the 2030 population projection.

² <https://www.etu.org.za/toolbox/docs/localgov/webundrstdlocgov.html>

³ <https://www.nkangaladm.gov.za/>

Table 4: Population of Emakhazeni Local Municipality [1]

Key Indicators	Census 2011	Community Survey 2016	Growth rate 2011-2016	Estimated 2019	Projected 2030
Population number	47 216	48 149	0.4% per annum	48 729	50 917
Household number	13 722	14 633	1.3 % per annum	15 208	17 519

5.3.2 Racial Composition

Table 5 and Table 6 indicate a slight increase in the Black African population while there is a noticeable decrease in the Coloureds, White and Indian population. Based on [1] in 2011, 87.2% of the population was Black, 10.8% White, 1.2% Coloureds, Indian and Asian 0.7%, and other was 0.2%. The percentages have since in 2016 to 89.4% Black Africans, 0.6% Coloureds, 0.3% Indian/ Asian and 9.7% Whites.

Table 5: Percentage Distribution of Emakhazeni Municipality by population group -2011 [1]

Group	Total	%
Black African	41 168	87.2%
Coloureds	563	1.2%
Indian or Asian	330	0.7%
White	5076	10.8%
Other	79	0.2%
Total	48.149	100%

Table 6: Percentage Distribution of Emakhazeni Municipality by Population Group- 2016 [1]

Group	Total	%
Black African	43 025	89.4%
Coloureds	322	0.6%
Indian or Asian	156	0.3%
White	4.646	9.7%
Total	48.149	100%

5.3.3 Education

In 2004 around 21% of the population had passed grades 3-6. This percentage decreased to approximately 11% in 2014 [4]. Figure 4 indicates that few people have post matric qualifications within the municipality. The implication is that the local community members will not be able to take advantage of job opportunities created by the economic sectors. This has a negative consequence on the payment of municipal rates and socio-economic conditions in the area. The municipality should then speed up the process of the establishment of a TVET (Technical and Vocational Education and Training) Campus. This campus will assist a great deal as it will focus on technical skills needed as the main economic activities relate to mining and trade [4].

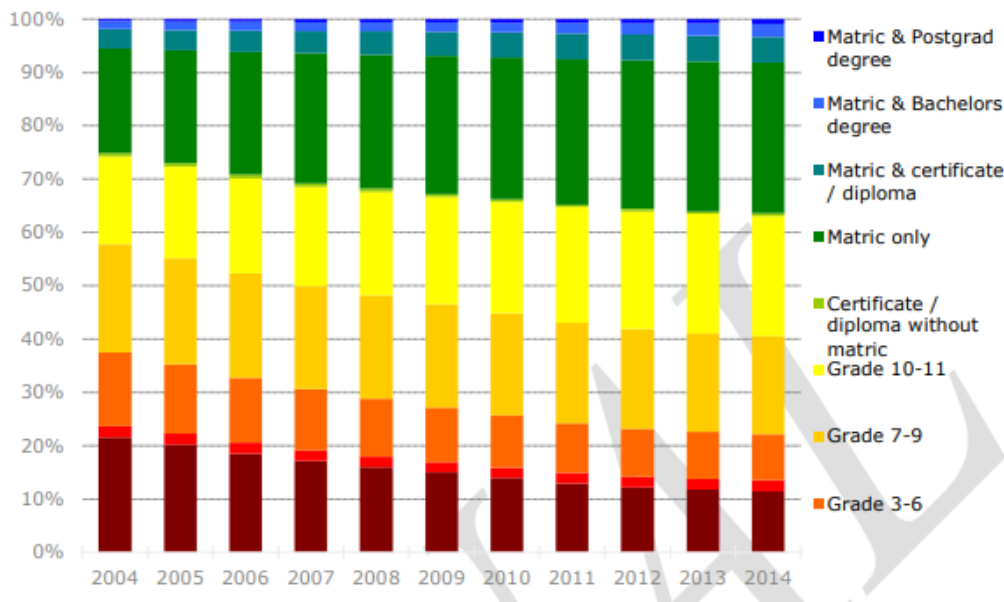


Figure 4: Educational attainment for Emakhazeni Local Municipality from 2004 to 2014 [4]

5.3.4 Employment

The unemployment rate of Emakhazeni decreased from 25.92% in 2011 to 23.8% in 2015 [4]. In 2015, the unemployment rate was the 7th lowest among all the municipal areas of Mpumalanga. In 2015, the unemployment rate for females was 29.2%, and 19.9% for males [4]. The municipality recorded an unemployment rate of 26.9% in 2017, with the majority of its employed in the mining and transport sectors [3].

5.3.5 Housing

According to the IDP for Emakhazeni Local Municipality [1], there is a need to prioritise the finalisation of township establishment so people can formally and adequately settle. Approximately 70% of people live in formal dwellings or brick/concrete houses. Traditional dwellings cover 10% of the population. These may be households in rural areas. However, there are still 4% living in an informal settlement and 6% in informal dwellings/shacks in the backyard. Figure 5 below shows the different dwellings in 2016 [1].

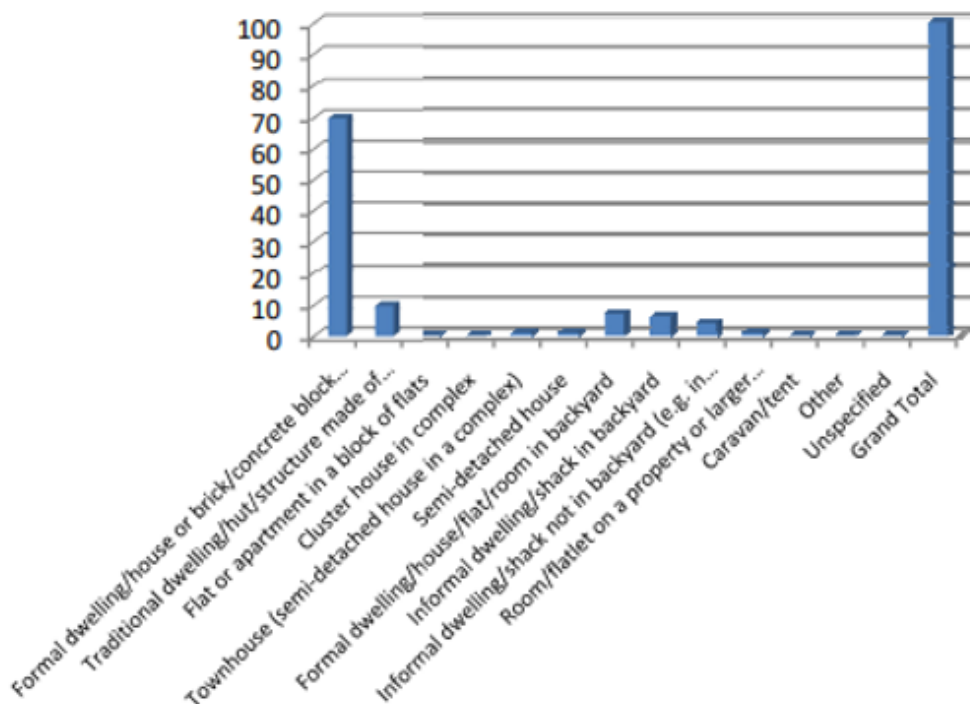


Figure 5: Different dwellings in Emakhazeni Local Municipality in 2016 [1]

5.3.6 Access to electricity

Access to electricity for lighting, cooking, and heating is an essential indicator of providing one of the key resources. Figure 6 shows the percentage of households with access to electricity in the municipality and other energy sources [1].

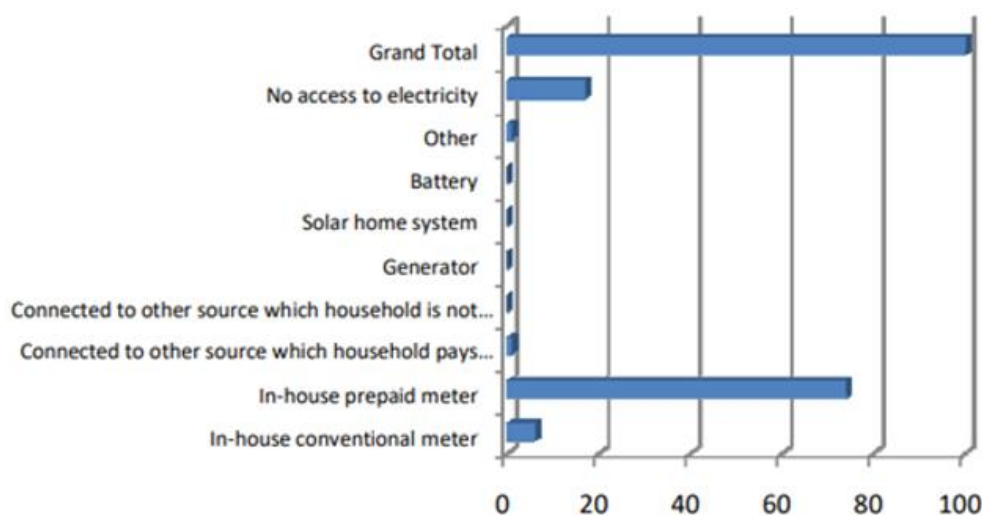


Figure 6: Percentage of household access to electricity [1]

6.0 IDENTIFICATION AND HIGH-LEVEL SCREENING IMPACTS

GNR 982 requires the identification of the significance of potential impacts during scoping. To this end, an impact screening tool has been used in the scoping phase. The screening tool is based on two criteria:

probability; and consequence, where the latter is based on a general consideration of the intensity, extent, and duration.

Table 7: Significance Screening Tool

Probability Scale		1	2	3	4
	1	Very Low	Very Low	Low	Medium
2	Very Low	Low	Medium	Medium	
3	Low	Medium	Medium	High	
4	Medium	Medium	High	High	

Table 8: Probability Scores and Descriptors

Score	Descriptor
4	Definite: The impact will occur regardless of any prevention measures
3	Highly Probable: It is most likely that the impact will occur
2	Probable: There is a good possibility that the impact will occur
1	Improbable: The possibility of the impact occurring is very low

Table 9: Consequence Score Description

Score	Negative	Positive
4	Very severe: An irreversible and permanent change to the affected system(s) or party(ies) which cannot be mitigated.	Very beneficial: A permanent and very substantial benefit to the affected system(s) or party(ies), with no real alternative to achieving this benefit.
3	Severe: Long-term impacts on the affected system(s) or party(ies) could be mitigated. However, this mitigation would be difficult, expensive or time consuming or some combination of these.	Beneficial: A long-term impact and substantial benefit to the affected system(s) or party(ies). Alternative ways of achieving this benefit would be difficult, expensive or time-consuming, or some combination of these.
2	Moderately severe: A medium to long-term impact on the affected system(s) or party (ies) that could be mitigated.	Moderately beneficial: A medium to long-term impact of real benefit to the affected system(s) or party(ies). Other ways of optimising the beneficial effects are equally difficult, expensive and time-consuming (or some combination of these) as achieving them in this way.
1	Negligible: A short to medium term impact on the affected system(s) or	Negligible: A short to medium term impact and negligible benefit to the affected system(s) or

Score	Negative	Positive
	party(ies). Mitigation is straightforward, cheap, less time consuming or not necessary.	party(ies). Other ways of optimising the beneficial effects are more accessible, cheaper and quicker, or some combination of these.
Significance (S) is determined by combining the criteria in the following formula:	$[S = (E + D + R + M) \times P]$ <p><i>Significance = (Extent + Duration + Reversibility + Magnitude) × Probability</i></p>	

The nature of the impact must be characterised as to whether the impact is deemed to be positive (+ve) (i.e. beneficial) or negative (-ve) (i.e. harmful) to the receiving environment/receptor. For ease of reference, a colour reference system (Table 10) has been applied according to the nature and significance of the identified impacts.

Table 10: Impact Significance Colour Reference System to Indicate the Nature of the Impact

NEGATIVE IMPACTS (-VE)	POSITIVE IMPACTS (+VE)
Negligible	Negligible
Very Low	Very Low
Low	Low
Medium	Medium
High	High

The key objectives of the risk assessment methodology are to identify any additional potential social issues and associated social impacts likely to arise from the proposed project, and to propose a significance ranking. Issues / aspects will be reviewed and ranked against a series of significance criteria to identify and record interactions

between activities and aspects and resources and receptors to provide a detailed discussion of impacts. The assessment considers direct⁴, indirect⁵, secondary⁶ as well as cumulative⁷ impacts.

6.1 Preliminary key impacts

The Dalmanutha Wind Energy Complex has been selected based on several factors namely: location to Eskom power station, wind resources, environmental constraints, grid connection, topography, site access, existing competition, and land availability [3]. The following section analyses the social impacts of the Dalmanutha facility with the preliminary impact's construction, operational and closure phase of the facility. The following section analyses the social impacts of the Dalmanutha facility. The ratings are indicated in the tables for pre impacts of the facility and post impact of the facility.

6.1.1 Construction phase

Increase in economic benefits

Electrical power is an essential part of many modern-day economies. The South African economy is influenced by mining and such operations require electricity to maintain mining operations. Manufacturing processes are dependent upon electrical machines to perform precise repetitive tasks which increase total factor productivity of present-day industry. Electricity powers the traffic lights and moderates the temperature around us. It is also the foundation of the digital economy and primary source of energy which people use daily for various tasks [5].

Four of Eskom's coal-fired power stations have been targeted for decommissioning in the short term: Komati, Camden, Grootvlei, and Hendrina. Eskom is looking to decommission 5400 MW of electricity from coal generation by the year 2022, increasing to 10500 MW by 2030 and 35000 MW by 2050. Simultaneously Eskom has been looking at options for repurposing these power stations with the core aim of reusing existing power transmission infrastructure, developing new generation capacity, providing ancillary services, and mitigating socio-economic impacts of the closure of the stations [3]. Currently, Eskom is making negative contributions to the economy due to load shedding.

During construction phase, Enertrag will require various goods and services. This requirement is likely to generate economic opportunities for local businesses. It is anticipated that the construction workforce will be housed in local accommodations (private homes, guest houses or rental options); this will also contribute to the growth of the local economy. Provided that a significant proportion of money derived from wages earned would likely be spent in the vicinity of the project area, it is expected to create substantial flows of revenue within surrounding communities, thus acting as a catalyst for growth in the formal and second economy.

Health and Safety Risk

During construction, noise affects humans differently, and the new noise which will be coming from the facilities. The construction of facilities can result in traffic and resources are being transported. Waste material that results from the construction could be detrimental to aesthetics and nearby community.

Social ills may also increase in the area with construction known to result in an influx of people from further afield seeking employment opportunities. The limited opportunities may result in increased unemployment in the area and thus increased crime.

⁴ Impacts that arise directly from activities that form an integral part of the Project.

⁵ Impacts that arise indirectly from activities not explicitly forming part of the Project.

⁶ Secondary or induced impacts caused by a change in the Project environment.

⁷ Impacts are those impacts arising from the combination of multiple impacts from existing projects, the Project and/or future projects.

Preferential Procurement

During construction phase, Enertrag will require labour, high and low skilled employees. Procurement should largely favour and benefit the local community. The municipality recorded an unemployment rate of 26.9% in 2017, the introduction of this project can increase employment rate and further allow skill development for the local community. Recruitment policy can be implemented that ensures preference to local residents. Furthermore, a monitoring system can be put in place for this policy. Local skills database can be developed and updated regularly to minimise the probability of nepotism or corruption during the recruitment process.

Local Content

Communities within the vicinity of the project should be given special consideration in terms of the benefits arising from the project because they will be the most affected. Enertrag shall give first preference to appropriate subcontractors located in the surrounding communities, followed by those located in the municipal area and lastly those situated elsewhere or outside the province. Resources that will be required during construction phase should be sourced preferably from local business. Accommodation required for contractors should favour local guesthouses and hostels. Development initiatives for communities that align with the project should be supported by Enertrag.

Table 11: Ratings of impact during construction phase

	Pre impact						Post impact					
	Magnitude	Extend	Reversibility	duration	Probability	significance	Magnitude	Extend	Reversibility	duration	Probability	significance
Economic benefits	1	2	1	3	2	14	4	4	3	4	3	45
Health and safety	2	2	1	2	3	21	4	3	3	4	4	56
Preferential Procurement	2	3	2	3	2	20	4	3	3	4	4	57
Local Content	2	3	3	2	3	30	4	3	4	4	4	60

6.1.2 Operational phase

Power Generation

South Africa has struggled to supplying enough power to all residence since 2007. In 1998 Eskom generation capacity model and max demand forecast showed problems in ten years' time [6]. It was told that existing plants without proper conservation cannot work for next 10 years. And the pace of population growth in South Africa made obvious that new plants will be needed soon [6]. A study done by Council for Scientific and Industrial

Research (CSIR) on load shedding shows the duration of outage on hours for the past 15 years. Power Generation is a great need in South Africa and its absence negatively impacts many. Therefore the country does need integration of other power sources that are renewable and less compromising to the environment.

The average annual wind speed in Dalmanutha ranges between 6 m/s to 7 m/s which is a sufficient resource to ensure the economic viability of a WEF [3] Furthermore, in this specific site, many conditions allow, such as location to Eskom power station, grid connection, topography, site access, existing competition, and land availability.

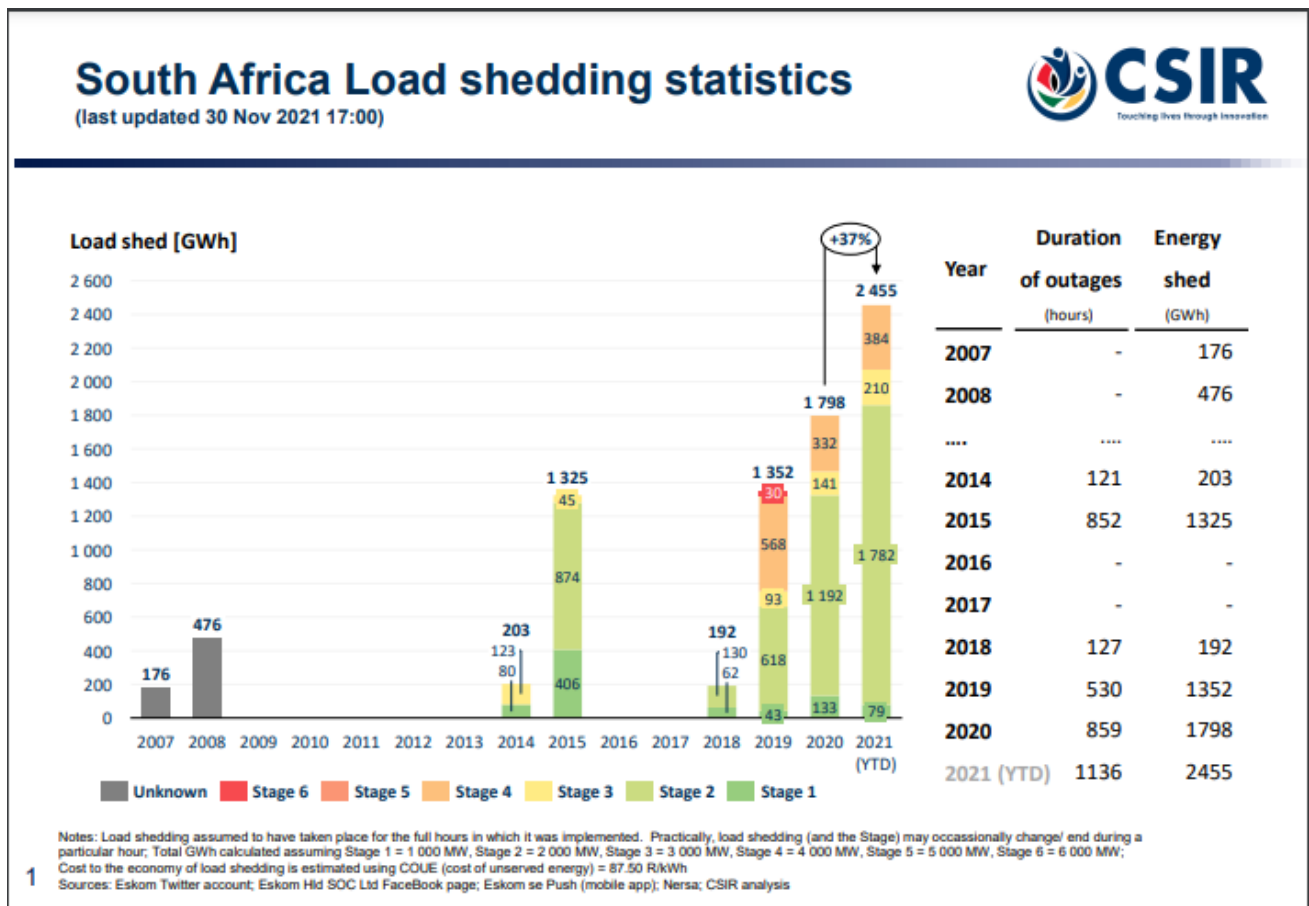


Figure 7: South Africa Load shedding statistics from 2007 to 2021⁸

Employment

The operational phase of the Dalmanutha WEF and the connection of the powerlines to the Gumeni MTS requires expertise and labour to deliver the final product. This project will allow local employment. The maintenance of the facility and its functioning over the years will create employment, which will contribute positively to the society in nearby communities. Unemployment in South Africa is negatively impacting communities, especially in the Emakhazeni Local Municipality (as demonstrated in 5.3.4). The Emakhazeni Local Municipality recorded an unemployment rate of 26.9% in 2017. The majority of the employed people are in the mining and transport sectors. The project will aid in solving two of the leading challenges faced by most municipalities in the country, namely the cost of electricity and lack of adequate employment opportunities.

⁸ <https://www.csir.co.za/sites/default/files/Documents/Loadshedding%20plot.pdf>

Environmentally friendly (low carbon)

As the seventh coal producer in the world, around 77% of South Africa’s electricity is generated from coal resulting in a high-level of environmental degradation [7]. South Africa’s per capita greenhouse emissions are the highest in Africa. South Africa has a large potential for both, solar and wind power generation, with smaller potential for biomass, landfill gas and hydropower [7]. The Renewable Energy Independent Power Producers Procurement Programme (REIPPPP) has allocated to over 92 Power Producers to injecting over 6,300MW of power into the power grid, mainly from solar and wind generation. The production of energy through coal (currently used mostly) has a moderately negative impact. The Dalmanutha project aligns very well with REIPPPP goals.

Social Economic Development

Enertrag will continue transferring skills to employees during operational phase. Employees will benefit from work experience and training programmes. Employees could further engage in a mentoring programme to add value and development to other individuals. Professional career opportunities will increase in the community. Knowledge on sustainable energy sources (such as wind energy) can be transferred to local residents.

Economic Development

During Operational phase, the employee's wage bill will result in a substantial injection of cash into the economies of the local and regional areas. This will stimulate development in formal and informal retail and downstream secondary industries. Furthermore the contribution of renewable energy resource contributes to electricity production efficiency.

Local Community Trust

The IDP for Emakhazeni Local Municipality [1], focuses largely on the need for basic services such as proper sanitation, landfill sites maintenance and non-functional streetlights. These can be improved through a community trust fund that help improve the community during operational phase. Local Non-Governmental Organisations (NGOs) and community initiatives that look into youth empowerment, development and innovative sustainable solutions can further benefit from the trust fund. This initiative could positively impact the unemployed youth within the Emakhazeni Local Municipality.

Table 12: Ratings impacts for operational phase

	Pre impact						Post impact					
	Magnitude	Extend	Reversibility	duration	Probability	significance	Magnitude	Extend	Reversibility	duration	Probability	significance
Power Generation	1	2	3	4	2	22	4	3	3	4	4	56
Employment	1	2	1	2	2	12	3	3	3	3	4	48

	Pre impact						Post impact					
	Magnitude	Extend	Reversibility	duration	Probability	significance	Magnitude	Extend	Reversibility	duration	Probability	significance
Environmentally friendly (low carbon)	3	4	3	5	2	30	4	4	4	4	4	64
Social Economic Development	2	3	2	3	3	30	3	4	4	3	4	56
Economic Development	2	3	3	2	3	30	4	3	4	4	4	60
Local Community Trust	2	3	2	3	2	20	4	4	3	3	3	42

6.2 Closure Phase

Loss of employment

During closure phase, the operational phase workforce will lose their jobs. Unfortunately, this may contribute to various adverse social consequences in the municipality and labour sending area such as:

- Increase or return of the unemployment rate to previous levels within the project area.
- Financial hardship and poverty.
- Family tensions and breakdown.
- Alienation, shame, and stigma, and
- Crime.

Reduced regional economic development

- There will be reduced local spending by Enertrag and its employees, including royalty and tax payments. Consequently, local businesses and the area may be affected financially.

Reduced community investment

- There will be a reduction in local community development investment from Enertrag.

	Pre impact						Post impact					
	Magnitude	Extend	Reversibility	duration	Probability	significance	Magnitude	Extend	Reversibility	duration	Probability	significance
Loss of employment	2	2	1	3	2	16	4	4	3	4	3	45
Reduced regional economic development	3	2	2	3	2	20					3	48
Reduced community investment	2	3	2	3	2	20		3	3		3	42

7.0 CUMULATIVE IMPACTS

Visual impacts

Development will significantly change the aesthetics of the project area. Construction activities, dust mobilisation and construction vehicles traversing the proposed site, as well as the presence of new infrastructure will transform the landscape. The turbines will be visually prominent from a considerable distance.

Employment

One of the most obvious positive short-term social impacts will be the creation of jobs. Construction activities will create a number of temporary employment opportunities. Other social impacts include the increased demand on local services, the influx of job seekers, social problems arising from population increase in the area, change in land use, social investment initiatives by Enertrag and the effect on sense of place.

Traffic impacts

Transportation of construction materials and workers to the WEF site, during the constructing is anticipated to have a much more significant impact on the condition of the transportation infrastructure and traffic volumes in the area. Abnormal load and construction vehicles have the potential to damage roads, create noise, dust, and cause risks impacts for other road users and residents in the area.

Economic benefits

Operational expenditure for the proposed project will contribute to the local and district municipal economies. The projected operational wage bill from employees would also provide an injection of cash into the local economy. This will stimulate the formal and informal retail and service sectors and secondary industries, having a positive multiplier effect on the local economy.

8.0 TERMS OF REFERENCE FOR SIA

The aim of the socio-economic impact assessment (SIA) will be to provide an accurate representation of the social, cultural and economic conditions of the people affected by the proposed Project, to assess the impact on these people and provide mitigation measures for any identified impacts.

8.1 Scope of Work

Following the approval of the ToR by the Mpumalanga Province: Department of Economic Development, Environment and Tourism, field work will be undertaken to collect socio-economic data. This study will employ a predominantly qualitative approach (i.e. interviews, meetings and focus group discussions) to gather data.

Data collection will be done by the following means:

Interviews for those affected by the proposed Project to develop a social profile. The following variables will be considered during the design of the questionnaire:

- Access to services;
- Agricultural practices and land use;
- Livelihoods; and
- Perceptions and attitudes towards the proposed Project.

The methodology for the impact assessment phase will be finalised when the social environment has been more clearly defined. The quantitative data will be gathered through interaction with affected communities and local key people will be used to compile a detailed report describing the socio-economic environment for the area affected by the proposed WEF.

9.0 CONCLUSION

Based on the review of key planning documents the development of renewable energy including WEF are supported nationally, provincially and at the local government levels.

The development of the proposed WEF will create employment, training, and business opportunities during both the construction and operation phases of the project. The potential negative impacts associated with the construction phase and operation phase can be mitigated. Detailed mitigation measures will be outlined in the Social Impact Assessment Report. Table 13 shows a summary of impact ratings for the WEF project.

The proposed development will also represent an investment in clean, renewable energy infrastructure for the country which will go some way to offset the negative environmental and socio-economic impacts associated with a coal-based fossil fuel energy generation. Renewable energy including WEF also addresses climate change and assists the country in meeting its climate change reduction goals.

The potential visual, noise and dust impacts will be assessed from these specialist studies to be undertaken as part of the EIA. The cumulative impacts on the area’s sense of place and assessment of significance of impacts will be informed by the findings of the visual and noise assessments undertaken for the proposed WEF as part of the EIA.

Table 13: Summary of impact ratings

	Pre impact	Post impact
	significance	significance
Construction phase		

	Pre impact	Post impact
	significance	significance
Economic contribution	14	45
Health and safety	21	56
Operational Phase		
Power Generation	22	56
Employment	12	24
Environmentally friendly (low carbon)	30	64
Reduced regional economic development	20	48
Reduced community investment	20	42
Closure		
Loss of employment	16	45
Reduced regional economic development	20	48
Reduced community investment	20	42

10.0 BIBLIOGRAPHY

- [1] EMAKHAZENI LOCAL MUNICIPALITY, “EMAKHAZENI LOCAL MUNICIPALITY 2018-2022 IDP,” 2018-2022.
- [2] Stats SA, “Census,” 2011. [Online]. Available: https://www.statssa.gov.za/?page_id=993&id=emakhazeni-municipality.
- [3] Enertrag, “DALMANUTHA WIND ENERGY FACILITY,” 2022.
- [4] Emakhazeni Local Municipality, “2020/21 IDP Review,” Emakhazeni Local Municipality, 2021.
- [5] A. Goldberg, “The economic impact of load shedding :The case of South African retailers,” University of Pretoria, Pretoria, 2015.
- [6] A. T. Marta Nowakowska, “Load shedding and the energy security of Republic of South Africa,” Journal of Polish Safety and Reliability Association , Wrocław, 2015.
- [7] S. J. P. P. K. Jainb, “The rise of Renewable Energy implementation in South Africa,” Elsevier Ltd, Johannesburg , 2017.
- [8] Intergovernmental Panel on Climate Change (IPCC), “IPCC special,” Cambridge University Press,, New York, 2012.
- [9] J. S. Samantha Ralston-Paton, “Wind energy’s impacts on birds in South Africa: A preliminary review of the results of operational monitoring,” BIRDLIFE SOUTH AFRICA, Johannesburg, 2017.

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