SiVEST (PTY) LTD

PROPOSED CONSTRUCTION AND OPERATION OF THE BATTERY ENERGY STORAGE SYSTEM (BESS) AND ASSOCIATED INFRASTRUCTURE AND INCLUSION OF ADDITIONAL LISTED ACTIVITIES FOR THE AUTHORISED DWARSRUG WIND ENERGY FACILITY LOCATED NEAR LOERIESFONTEIN, HANTAM LOCAL MUNICIPALITY, NAMAKWA DISTRICT MUNICIPALITY IN THE NORTHERN CAPE PROVINCE, IN THE NORTHERN CAPE PROVINCE OF SOUTH AFRICA.

Social Impact Assessment

DEA Reference: 2020-09-0027
Report Prepared by: **Dr Neville Bews & Associates**
Issue Date: 05 November 2020
Version No.: 01

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SOCIAL IMPACT ASSESSMENT

EXECUTIVE SUMMARY

Introduction

South Africa Mainstream Dwarsrug Wind Energy Facility (Pty) Ltd is proposing the construction and operation of a Battery Energy Storage System (BESS) and associated infrastructure for the authorised Dwarsrug Wind Energy Facility (WEF) (14/12/16/3/3/2/690). The BESS is located on the authorised Dwarsrug WEF (14/12/16/3/3/2/690), located near Loeriesfontein in the Hantam Local Municipality, Namakwa District Municipality, in the Northern Cape Province of South Africa.

Project Description

The need for a BESS stems from the fact that electricity is only produced by the Renewable Energy Facility while the sun is shining, while the peak-demand may not necessarily occur during the daytime. Therefore, the storage of electricity and supply thereof during peak-demand will mean that the facility is more efficient, reliable and electricity supply more constant.

The BESS will:

- Store and Integrate a greater amount of renewable energy from the Renewable Energy Facility into the electricity grid;
- This will assist to generate electricity utilising renewable energy to feed into the National Grid which will be procured under either the Renewable Energy Independent Power Producer Procurement Program (REIPPPP), other government-run procurement programs or for sale to private entities if required.

The Dwarsrug WEF BESS will be located next to the approved Dwarsrug WEF substation associated with the approved Dwarsug WEF. To reduce electrical losses the BESS must be in close proximity to

the on-site 33/132kV substation. A ~5ha study site has been established around the approved substation (500 m zone) to allow for the micro siting/specialist guidance regarding placement can be made..

No site alternatives for this proposed development were considered as the placement of the proposed BESS is dependent on the location of the Dwarsrug Wind Energy Facility (WEF) (14/12/16/3/3/2/690). Technology alternatives are limited to battery types, namely Redox flow batteries and Solid-State Batteries. No other activity alternatives are being considered.

Social impacts

In 2015 Urban-Econ Development Economists undertook a social impact assessment for the Dwarsrug Wind Farm. The project subsequently received environmental authorisation under the following authorisation number 14/12/16/3/3/2/690. Through their assessment, Urban-Econ Development Economists identified the following social impacts and attached the following rating to these impacts (Urban-Econ Development Economists, 2015, p. 71).

Impact	Nature	Pre mitigation significance	Post mitigation significance
Construction phase assessment results			
Temporary increase in production	Positive	High (54)	High (54)
Temporary stimulation of GDP-R	Positive	High (54)	High (54)
Temporary employment creation	Positive	High (54)	High (54)
Increased household income and standard of living	Positive	High (54)	High (54)
Skills development	Positive	Medium (45)	Medium (48)
Increase in government revenue	Positive	Low (18)	Low (18)
Agricultural activities in the zone of influence due to movement of vehicles and workers	Negative	Low (10)	Low (10)
Change in demographics of the area	Negative	Medium (30)	Low (28)
Increase in social pathologies	Negative	Medium (48)	Medium (45)
Deterioration of living and working conditions	Negative	Low (14)	Low (14)
Added pressure on infrastructure	Negative	Medium (45)	Medium (30)
Operational phase assessment results			
Sustainable increase in production	Positive	High (40)	High (40)
Sustainable increase in GDP-R	Positive	High (40)	High (40)
Creation of long-term employment opportunities	Positive	High (40)	High (40)
Increased household income and standard of living	Positive	High (40)	High (40)
Skills development	Positive	Low (17)	Low (18)
Sustainable increase in government revenue stream	Positive	Low (19)	Low (19)
Investment in local communities due to SED and ED	Positive	Medium (34)	Medium (34)
Impact on property and land value	Positive	Low (11)	Low (11)

Considering this and the nature of the project in that:

- It will be a component of an existing approved facility.
- To reduce electrical losses, the location is restricted to within close proximity of the approved substation.

- A ~5 ha study site has been established around the approved substation (500 m zone) allowing for micro siting/specialist guidance regarding the placement to be made.

It is unlikely that the project will result in any additional negative social impacts over both the construction and operational phases. The scale of the project is also small and therefore it is also most unlikely that it will result in any additional negative cumulative social impacts within the immediate area.

Discussion

It is apparent that the project will have significant social benefits at a regional, and probably also at a national level. The project aims to install and operate a BESS that will store energy collected via the renewable energy facility during off-peak periods, making it available during periods of high demand. Besides, the BESS will increase the efficiency, reliability and consistency of energy supply by storing energy that can bridge those periods when the renewable energy facility is forced to run below capacity due to weather or maintenance reasons.

The objective of the proposed development is to ensure that the Dwarsrug Wind Energy Facility (WEF) can store and integrate a greater amount of renewable energy into the National Grid. This is important for the facility to be more efficient and reliable and to deliver a more consistent supply of electricity.

The BESS will be located adjacent to the approved Dwarsrug WEF substation associated with the approved Dwarsrug WEF. Consequently, it is most unlikely that the proposed project will increase the significance of the impacts identified and assessed by Urban-Econ Development Economists; or result in any additional impacts. It is clear, however, that the project has the potential to increase the efficiency, reliability and consistency of the electricity delivered by the Dwarsrug WEF. This will have a positive impact regarding business confidence, public health and safety and the nuisance factor associated with frequent electricity outages.

Impact Statement

Considering all social impacts associated with the project, it is evident that the positive elements outweigh the negative and that the project carries with it significant social benefits. In addition, the project fits with international and governmental policy and legislation. Consequently, the proposed installation of a BESS at the authorised Dwarsrug Wind Energy Facility (WEF) (14/12/16/3/3/2/690) is supported at the social level and no further assessment would be required.

Discussion

It is apparent that the project will have significant social benefits at a regional, and probably also at a national level. The project aims to install and operate a BESS that will store energy collected via the renewable energy facility during off-peak periods, making it available during periods of high demand. Besides, the BESS will increase the efficiency, reliability and consistency of energy supply by storing energy that can bridge those periods when the renewable energy facility is forced to run below capacity due to weather or maintenance reasons.

The objective of the proposed development is to ensure that the Dwarsrug Wind Energy Facility (WEF) can store and integrate a greater amount of renewable energy into the National Grid. This is important for the facility to be more efficient and reliable and to deliver a more consistent supply of electricity.

The BESS will be located adjacent to the approved Dwarsrug WEF substation associated with the approved Dwarsrug WEF. Consequently, it is most unlikely that the proposed project will increase the significance of the impacts identified and assessed by Urban-Econ Development Economists; or in any additional impacts. It is clear, however, that the project has the potential to increase the efficiency, reliability and consistency of the electricity delivered by the Dwarsrug WEF. This will in turn have positive impacts in respect of business confidence, public health and safety and the nuisance factor associated with frequent electricity outages.

Impact Statement

Considering all social impacts associated with the project, it is evident that the positive elements outweigh the negative and that the project carries with it significant social benefits. Also, the project fits with international and governmental policy and legislation. Consequently, the proposed installation of a BESS at the authorised Dwarsrug Wind Energy Facility (WEF) (14/12/16/3/3/2/690) is supported at the social level and no further assessment would be required.

NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 (ACT NO. 107 OF 1998) AND ENVIRONMENTAL IMPACT REGULATIONS, 2014 (AS AMENDED) - REQUIREMENTS FOR SPECIALIST REPORTS (APPENDIX 6)

Regulation GNR 326 of 4 December 2014, as amended 7 April 2017, Appendix 6	**Section of Report**
1. (1) A specialist report prepared in terms of these Regulations must contain- a) details of- i. the specialist who prepared the report; and ii. the expertise of that specialist to compile a specialist report including a curriculum vitae;	Section 1.3
b) a declaration that the specialist is independent in a form as may be specified by the competent authority;	Appendix 2
c) an indication of the scope of, and the purpose for which, the report was prepared;	Section 1.1
(cA) an indication of the quality and age of base data used for the specialist report;	Section 2.2
(cB) a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;	Section 0
d) the date and season of the site investigation and the relevance of the season to the outcome of the assessment;	N/A
e) a description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used;	Appendix 1
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;	Section 0
g) an identification of any areas to be avoided, including buffers;	None
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;	Figure 1
i) a description of any assumptions made and any uncertainties or gaps in knowledge;	Section 2.1
j) a description of the findings and potential implications of such findings on the impact of the proposed activity, (including identified alternatives on the environment) or activities;	Sections 0 & 8

k) any mitigation measures for inclusion in the EMPr;	Non
l) any conditions for inclusion in the environmental authorisation;	None
m) any monitoring requirements for inclusion in the EMPr or environmental authorisation;	None
n) a reasoned opinion- i. (as to) whether the proposed activity, activities or portions thereof should be authorised; (iA) regarding the acceptability of the proposed activity or activities; and ii. if the opinion is that the proposed activity, activities or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan;	Section 8.1
o) a description of any consultation process that was undertaken during the course of preparing the specialist report;	None
p) a summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	None
q) any other information requested by the competent authority.	N/A
2) Where a government notice *gazetted* by the Minister provides for any protocol or minimum information requirement to be applied to a specialist report, the requirements as indicated in such notice will apply.	N/A

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SOCIAL IMPACT ASSESSMENT

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List of Abbreviations

BESS	Battery Energy Storage System
COVID-19	Coronavirus Disease of 2019.
CPV	Concentrator photovoltaics
DEFF	Department of Environment, Forestry and Fisheries
DEA	Department of Environmental Affairs
DEAT	Department of Environmental Affairs and Tourism
DM	District Municipality
DMRE	Department of Mineral Resources and Energy
EIA	Environmental Impact Assessment
HIV	Human Immunodeficiency Virus
IDP	Integrated Development Plan
IPCC	Intergovernmental Panel on Climate Change
IRP	Integrated Resource Plan
IRR	Issues and Response Report
kV	Kilovolt
LM	Local Municipality
MW	Megawatt
NEMA	National Environmental Management Act (No. 107 of 1998)
NERSA	The National Energy Regulator of South Africa
NGO	Non-Governmental Organisation
NU	Non-Urban
OHP	Overhead Power Line
OHS	Occupational Health and Safety
O&M	Operation and Maintenance
PA	Per annum (Yearly)
PGDS	Provincial Growth and Development Strategy
PV	Photovoltaic
PPP	Public Participation Process
REIPPPP	Renewable Energy Independent Power Producer Procurement Program
RMIPPPP	Risk Mitigation Independent Power Producer Procurement Programme
SACPVP	South African Council for the Property Valuers Profession
SAHRA	South African Heritage Resources Agency
SDF	Spatial Development Framework
SIA	Social Impact Assessment
SMME	Small Medium and Micro Enterprises
Stats SA	Statistics South Africa
ToR	Terms of Reference
WWF	World Wild Fund for Nature

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SOCIAL IMPACT ASSESSMENT

1. INTRODUCTION

Dr Neville Bews & Associates has been appointed by SiVEST (PTY) Ltd, on behalf of South Africa Mainstream Dwarsrug Wind Energy Facility (Pty) Ltd to assess the development of a Battery Energy Storage System (BESS) and associated infrastructure for the authorised Dwarsrug Wind Energy Facility (WEF) (14/12/16/3/3/2/690), located near Loeriesfontein in the Hantam Local Municipality, Namakwa District Municipality, Northern Cape Province, South Africa.

In terms of the Environmental Impact Assessment (EIA) Regulations, which were published on 04 December 2014 and amended on 07 April 2017 [promulgated in Government Gazette 40772 and Government Notice (GN) R326, R327, R325 and R324 on 7 April 2017], various aspects of the proposed development are considered listed activities under GNR 327 and GNR 324 which may have an impact on the environment and therefore require authorisation from the National Competent Authority (CA), namely the Department of Environment, Forestry and Fisheries (DEFF), before the commencement of such activities. Dr Neville Bews & Associates have been commissioned to assess and verify the BESS under the new Gazetted specialist protocols.

1.1 Scope and Objectives

Assess the impacts associated with the installation of a BESS on the Dwarsrug Wind Energy Facility (WEF) (14/12/16/3/3/2/690).

1.2 Terms of Reference

The following terms of reference apply to the study:

- The Site Verification Report and Compliance Statement / Specialist Report must be in line with the DEA Screening Tool Specialist theme Protocols (As gazetted 20 March 2020) if they apply. If they do not, the report must be written in accordance with Appendix 6 of the EIA Regulations, 2014 (as amended);
- A table at the beginning of your report cross-referencing how the requirements for specialist according to Appendix 6 of the EIA Regulations, 2014 (as amended) has been adhered to. An MS Word version will be provided;
- A thorough overview of all applicable legislation, policies, guidelines. etc.;
- Identification of sensitive and/or 'no-go' areas to be avoided;
- Recommend mitigation measures to minimise the impact of the proposed development;
- Provide implications of specialist findings for the proposed development (e.g. permits, licenses etc.);
- Specify if any further assessment will be required;
- Include an Impact Statement, concluding whether any fatal flaws have been identified and ultimately whether the proposed development can be authorised or not (i.e. whether EA should be granted/issued or not).

1.3 Specialist Credentials

Qualifications:
University of South Africa: BA (Honours) – 1984
Henley Management College, United Kingdom: The Henley Post-Graduate Certificate in Management – 1997
Rand Afrikaans University: M.A. (cum laude) – 1999
Rand Afrikaans University: D. Litt. et Phil. – 2000

Projects:
The Social Impact Assessment (SIA) for the Gautrain Rapid Rail Link; The impact assessment for the Australian – South African sports development programme; SIA for Kumba Resources, Sishen South Project; Evaluation of a Centre for Violence Against Women for The United Nations Office on Drugs and Crime; SIAs for the following Exxaro Resources Ltd.'s mines, Leeuwpan Coal Mine Delmas, Glen Douglas Dolomite Mine Henley-on-Klip, Grootegeluk Open Cast Coal Mine Lephalale; SIA for the South African National Road Agency Limited (SANRAL) on Gauteng Freeway Improvement Project; SIA for SANRAL on the N2 Wild Coast Toll Highway; Research into research outputs of the University for the University of Johannesburg; SIA for Waterfall Wedge housing and business development in Midrand Gauteng; SIA for the Environmental Management Plan for Sedibeng District Municipality; Social and Labour Plan for the Belfast Project on behalf of Exxaro Resources Ltd; SIA for the Transnet New Multi-Product Pipeline (Commercial Farmers) on behalf of Golder Associates Africa (Pty) Ltd; SIA for the Proposed Vale Moatize Power Plant Project in Mozambique on behalf of Golder Associates Africa (Pty) Ltd; SIA for Kumba Resources Ltd.'s proposed Dingleton Resettlement Project at Sishen Iron Ore Mine on behalf of Water for Africa (Pty) Ltd; SIA for Gold Fields West Wits Project

for EcoPartners; SIA for the Belfast Project for Exxaro Resources Ltd; SIA for Eskom Holdings Ltd.'s Proposed Ubertas 88/11 kV Substation on behalf of KV3 Engineers (Pty) Ltd; SIA for the Mokolo and Crocodile River (West) Water Augmentation Project for the Department of Water and Sanitation on behalf of Nemai Consulting and the Trans Caledonian Water Authority; Assisted Octagon Consulting with the SIA for Eskom's Nuclear 1 Power Plant on behalf of Arcus GIBB Engineering & Science. SIA for the 150 MW Photovoltaic Power Plant and Associated Infrastructure for Italgest Energy (Pty) Ltd, on behalf of Kalahari Survey Solutions cc. SIA for Eskom Holdings Limited, Transmission Division's Neptune-Poseidon 400kV Power Line on behalf of Nemai Consulting. Ncwabeni Off-Channel Storage Dam for the security of water supply in Umzumbe, Mpumalanga. Social Impact Assessment for Eskom Holdings Limited, Transmission Division, Forskor-Merensky 275kV ±130km Power line and Associated Substation Works in Limpopo Province. Social impact assessment for the proposed infilling of the Model Yacht Pond at Blue Lagoon, Stiebel Place, Durban.ABC Prieska Solar Project; Proposed 75 MWp Photovoltaic Power Plant and its associated infrastructure on a portion of the remaining extent of ERF 1 Prieska, Northern Cape.Sekoko Wayland Iron Ore, Molemole Local Municipalities in Limpopo Province.Langpan Chrome Mine, Thabazimbi, Limpopo; Jozini Nodal Expansion Implementation Project, Mpumalanga, on behalf of Nemai Consulting; SIA for Glen Douglas Dolomite Burning Project, Midvaal Gauteng, on behalf of Afrimat Limited; SIA for Lyttelton Dolomite mine Dolomite Burning Project, Marble Hall Limpopo on behalf of Afrimat Limited; Tubatse Strengthening Phase 1 – Senakangwedi B Integration for Eskom Transmission on behalf of Nsovo Environmental Consulting; Department of Water and Sanitation, South Africa (2014). Environmental Impact Assessment for the Mzimvubu Water Project: Social Impact Assessment DWS Report No: P WMA 12/T30/00/5314/7. Umkhomazi Water Project Phase 1 – Raw Water Component Smithfield Dam - 14/12/16/3/3/3/94; Water Conveyance Infrastructure - 14/12/16/3/3/3/94/1; Balancing Dam - 14/12/16/3/3/3/94/2. Umkhomazi Water Project Phase 1 – Potable Water Component: 14/12/16/3/3/3/95. Expansion of Railway Loops at Arthursview; Paul; Phokeng and Rooiheuwel Sidings in the Bojanala Platinum District Municipality in the North West Province for Transnet Soc Ltd; Basic Social Impact Assessment for the Cato Ridge Crematorium in Kwazulu-Natal Province; SIA for the Kennedy Road Housing Project, Ward 25 situated on 316 Kennedy Road, Clare Hills (Erf 301, Portion 5); Eskom's Mulalo Main Transmission Substation and Power Line Integration Project, Secunda;

Affiliation:
Registered on the database for scientific peer review of iSimangaliso GEF project outputs.

1.4 Assessment Methodology

Data was gathered using the following techniques:

- The project description prepared by Dwarsrug Wind Energy Facility (WEF).
- Dwarsrug Socio-Economic Impact Assessment: Final Report May 2015; Urban-Econ Development Economists.
- Statistics South Africa, Census 2011 and other relevant demographic data generated by Stats SA such as the Quarterly Labour Force Survey and Mid-year Population Estimates.
- Discussions with the project proponents and Environmental Impact Assessment Consultants.
- A site sensitivity verification through the national web-based environmental screening tool; attached as Appendix 2.
- A literature review of various documents such as the relevant Municipal Integrated Development Plans (IDPs) and other specialist reports and documents.
- A broader literature scan.

The assessment technique used to evaluate the social impacts, as provided by SiVEST Environmental Division, is attached as Appendix 1.

2. ASSUMPTIONS AND LIMITATIONS

2.1 Assumptions

It is assumed that the technical information provided by the project proponent, Dwarsrug Wind Energy Facility (WEF) and the environmental consultants, SiVEST SA (Pty) Ltd, was credible and accurate at the time of compiling the report. It is also assumed that the data provided by the various specialists as used in this report are credible and accurate.

2.2 Limitations

The demographic data used in this report was sourced from Statistics South Africa and is based on data gathered during Census 2011 and Community Survey, 2016. This data is somewhat outdated but where possible is supplemented with the latest Stats SA's survey data such as the Mid-year population estimates and the Quarterly Labour Force Survey.

No site visit was undertaken as the region was sparsely populated and where necessary information could be obtained from the environmental consultants. Apart from this, the study was undertaken during the State of National Disaster declared in South Africa as a result of the COVID-19 pandemic. Accordingly, the need for social distancing and limiting unnecessary interpersonal contact and travel was respected throughout this study.

3. TECHNICAL DESCRIPTION

3.1 Project Location

The BESS is located on the authorised Dwarsrug WEF (14/12/16/3/3/2/690), located near Loeriesfontein in the Hantam Local Municipality, Namakwa District Municipality, in the Northern Cape Province of South Africa.

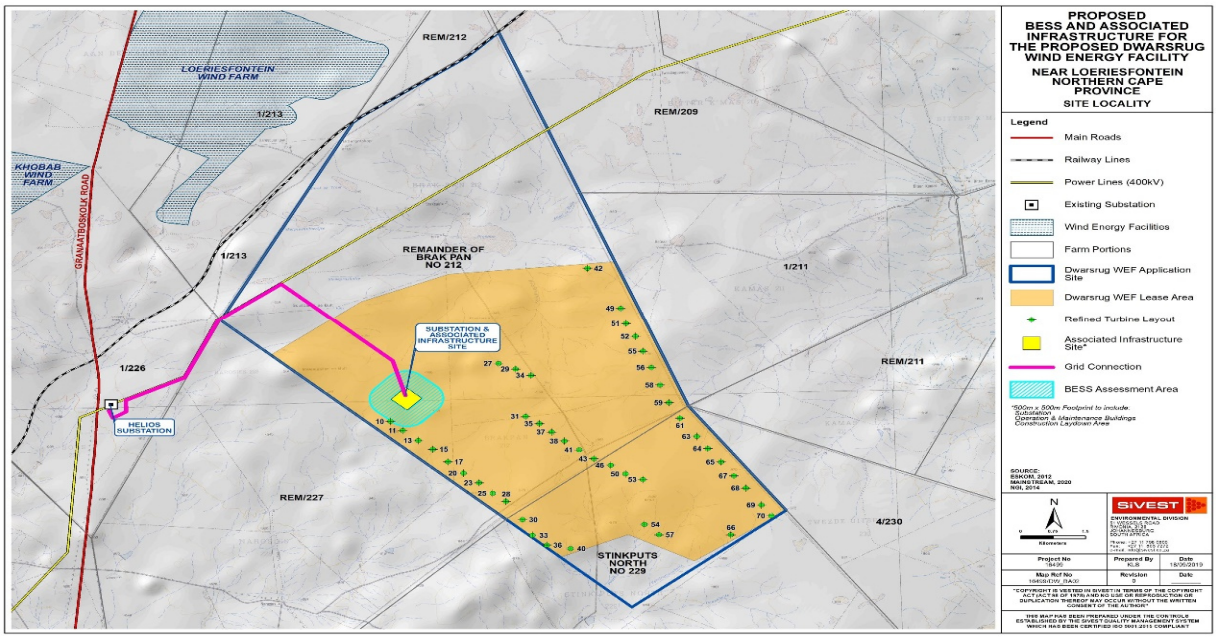


Figure 1: Location of BESS on the authorised Dwarsrug WEF

3.2 Project Description

South Africa Mainstream Renewable Power Developments (Pty) Ltd is proposing the construction and operation of a BESS and associated infrastructure for the authorised Dwarsrug WEF (14/12/16/3/3/2/690). The need for a BESS stems from the fact that electricity is only produced by the Renewable Energy Facility while the wind is blowing, while the peak demand may not necessarily occur during the day-time. Therefore, the storage of electricity and supply thereof during peak-demand will mean that the facility is more efficient, reliable and electricity supply more constant.

The BESS will:

- Store and Integrate a greater amount of renewable energy from the Renewable Energy Facility into the electricity grid;
- This will assist with the objective to generate electricity by means of renewable energy to feed into the National Grid which will be procured under either the Renewable Energy Independent

Power Producer Procurement Program (REIPPPP), other government run procurement programmes or for sale to private entities if required

The Dwarsrug WEF BESS will be located adjacent to the approved Dwarsrug WEF substation associated with the approved Dwarsug WEF. To reduce electrical losses the BESS must be in close proximity to the on-site 33/132kV substation. A ~5ha study site has been established around the approved substation (500 m zone) to allow for the micro siting/specialist guidance regarding placement can be made.

3.2.1 Alternatives

No site alternatives for this proposed development were considered as the placement of the proposed BESS is dependent on the location of the Dwarsrug WEF (14/12/16/3/3/2/690).

Technology alternatives are limited to battery types, namely Redox flow batteries and Solid State Batteries. No other activity alternatives are being considered.
The BESS alternatives:

BESS Specifications	
BESS Footprint	Up to 2 Ha
BESS Capacity	200 MWh
BESS Technology	Lithium Ion
BESS Type Alternative- Solid State Batteries	Containerised systems assembled within shipping containers and delivered to the project site. Dimensions are approximately 17 m long x 3.5 m wide x 4 m high. Containers will be placed on a raised concrete plinth (30 cm) and may be stacked on top of each other to a maximum height of approximately 15 m. Additional instrumentation, including inverters and temperature control equipment, may be positioned between the battery containers.

'No-go' alternative:
The 'no-go' alternative is the option of not constructing and operating a BESS in support of the authorised Renewable Energy (RE) facility. This option would result in the status quo being maintained and would prevent the proposed development from contributing to the environmental, social and economic benefits associated with a more efficient, reliable and consistent electricity supply.

4. LEGAL REQUIREMENT AND GUIDELINES

Legislation and policy serve to guide the authorities in undertaking and agreeing on projects that are in the interest of the country as a whole. Consequently, the fit of the project with the relevant national,

provincial and municipal legislation and policy is an important consideration. In this respect, the following legislation and policy are applicable to the project.

4.1 International

- Climate Change Action Plan, 2016-2020, World Bank Group (2016)
- Renewable Energy Vision 2030 – South Africa; World Wildlife Fund for Nature-SA (formerly World Wildlife Fund-SA) (2014)
- REthinking Energy 2017: Accelerating the global energy transformation. International Renewable Energy Agency, (2017)
- Renewable Energy Policies in a Time of Transition. International Renewable Energy Agency (2018)
- Global Warming of 1.5 °C. An IPCC special report on the impacts of global warming of 1.5 °C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty. Summary for Policymakers. Subject to copy-edit: Intergovernmental Panel on Climate Change (2018).

4.2 National

- White Paper on the Energy Policy of the Republic of South Africa (1998)
- White Paper on Renewable Energy (2003)
- The Constitution of South Africa (1996)
- A National Climate Change Response Strategy for South Africa (2004)
- National Energy Act (2008)
- Integrated Resource Plan (IRP) for South Africa (2010-2030)
- The Environmental Impact Assessment and Management Strategy for South Africa (2014)
- Government Gazette Vol. 632; 16 February 2018 No. 41445. Department of Environmental Affairs, No. 114, Page No. 92 (2018)
- Government Gazette No. 43734; 25 September 2020, Notice No. 1015; Determination Under Section 34(1) of the Electricity Regulation Act, 2006 (Act No. 4 of 2006)
- Department of Mineral Resources and Energy's Independent Power Producers Procurement Programme (2020)
- New Growth Path Framework (2010)
- The National Development Plan (2011)
- National Infrastructure Plan (2012).

4.3 Provincial

- Northern Cape Provincial Growth and Development Strategy (2004-2014)
- Northern Cape Province Twenty Year Review (2014)
- Northern Cape Climate Change Response Strategy

- Northern Cape Spatial Development Framework
- Northern Cape Department of Environment & Nature Conservation Annual Report (2016/17)
- Northern Cape Department of Economic Development & Tourism Annual Report (2017)
- Northern Cape State of the Province Address (2018).

4.4 District and Local

- Hantam Municipality Integrated Development Plan (IDP) 2020/2021 (Final)
- Namakwa District Municipality Integrated Development Plan Revision 2020-2021.

4.5 Policy and Legislation Fit

Considering the nature and location of the project, there is a clear fit with international, national, provincial and local, at both district and municipal levels, policy and legislation. For instance, the World Wild Life Fund for Nature (WWF)

> " …*calls for a more ambitious plan, suggesting that the IRP* [Integrated Resource Plan for Electricity] *should provide for an 11-19% share of electricity capacity by 2030, depending on the country's growth rate over the next fifteen years*" (Sager, 2014, p. 5).

The issue of climate change is high on the agenda of all levels of government in South Africa, with the Department of Environmental Affairs and Tourism indicating that;

> "*The efforts of all stakeholders will be harnessed to achieve the objectives of the Government's White Paper on Renewable Energy (2003) and the Energy Efficiency Strategy, promoting a sustainable development path through coordinated government policy*" (Department of Environmental Affairs and Tourism, 2004, p. 23).

DEAT goes further in specifically listing renewable energy sources, including wind power, solar power and biomass, as a tool in promoting mitigation against climate change.

In terms of the capacity determinations of the Minister of Energy, in consultation with the National Energy Regulator (NERSA), it has been established that South Africa required;

> *The technological composition of additional new capacity to be added between 2019 and 2030 is as follows:*
> *Wind: 14400 MW (45.7%);*
> ***Solar photovoltaic (PV):** 6000 MW (19.1%);*
> ***Gas and/or diesel:** 3000 MW (9.5%);*
> *Hydroelectricity: 2500 MW (7.9%);*
> ***Energy storage:** 2088 MW (6.6%);*
> ***Coal:** 1 500 MW (4.8%); and*
> ***Range of energy technologies to fill the short-term capacity gap:** 2000 MW (6.4%)"* (Independent Power Producer Office, 2020a, p. 5).

> With the Northern Cape contributing 22 6332 GWh[2] to the National Grid of which 11 509 GWh is through Solar PV (51%) and 6 554 GWh is through wind (29%) (Independent Power Producers Procurement Office, 2020b, p. 3).

On 16 February 2018, the boundaries of eight Renewable Energy Zones (REZs) that are of strategic importance for large scale wind and solar photovoltaic for the country were gazetted (Government Gazette No. 41445, 2018). In respect of these zones, the project is located partly within the Renewable Energy Development Zone 2, which is located in the Komsberg region and falls across the borders of the Northern and Western Cape Provinces. The project, however, does not fall completely within this zone with a section falling outside the zone.

On 25 September 2020 (Government Notice No. 1015 in Government Gazette No. 43734) the Minister of Mineral Resources and Energy amended the regulations governing the generation of electricity. This created additional capacity to contribute towards energy security with the requirement that Eskom Holdings SOC Limited purchase additional electricity from independent power producers. Of this 6 800 MW should be sourced from renewable energy sources, both wind and solar; 513 MW from storage and 3 000 MW from gas and diesel. The project fits with this requirement.

The Northern Cape Department of Economic Development and Tourism identifies six economic development opportunities, one of which is renewable energy, and states that;

> "*During the financial year* [2017/18] *the intension is to focus on additional opportunities such as, Renewable Energy, a focus area of the 9-Point Plan*" (Northern Cape Province. Department of Economic Development & Tourism, 2017, p. 10 & 15).

The importance of renewable energy facilities within the Northern Cape has been recognised in the province's Twenty-Year Review 2014, where it is indicated that;

> "*The New Growth Path that was adopted by national government in 2010 identified the green economy as a new economic sector that will be key to the creation of jobs. The focus of the green economy is on renewable energy and the Northern Cape was identified as the solar hub of the country with a number of solar plants being established across the province*" (Northern Cape Province, 2014, p. 153).

On a municipal level, support is also evident. In the Namakwa District Municipality Integrated Development Plan Revision 2020-2021 it is stated that;

> "*The role of local government in the electricity distribution industry, including consideration of renewable energy, reticulation, and municipal debt and tariff structures will be critical, as will its role in sustainable management of water and sanitation for all"* (Namakwa District Municipality, 2020, p. 51).

While in the Hantam IDP 2020/2021 it is stated that:

> "*The establishment of the SKA project and a few renewable energy projects in the region will positively impact on the economy of the municipal area. And that; "[t]he main economic sectors in Hantam are Agriculture, Tourism, Mining and Renewable Energy* (Hantam Lacal Municipality, 2020, p. 31) ".

The municipality recognises the following contributions from:

South Africa Mainstream Renewable Power Developments (Pty) Ltd	Upgrading of play parks Replace VIP toilets with toilets connected to sanitation system Provision of outdoor gym Tarring of roads Construct a two-lane bridge for pedestrian & vehicles Assist with paving of street (Mainstream to provide pavers and material and Municipality to provide labour) Agreement for maintenance of water purification plant for irrigation of sports field for a number of years Prepaid water meters to households

(Hantam Lacal Municipality, 2020, p. 112).

Considering the policy and legislation referred to above, the project largely fits this framework; particularly in respect of the delivery of efficient and reliable renewable energy. In the following section, a description of the affected environment is provided.

5. DESCRIPTION OF THE RECEIVING ENVIRONMENT

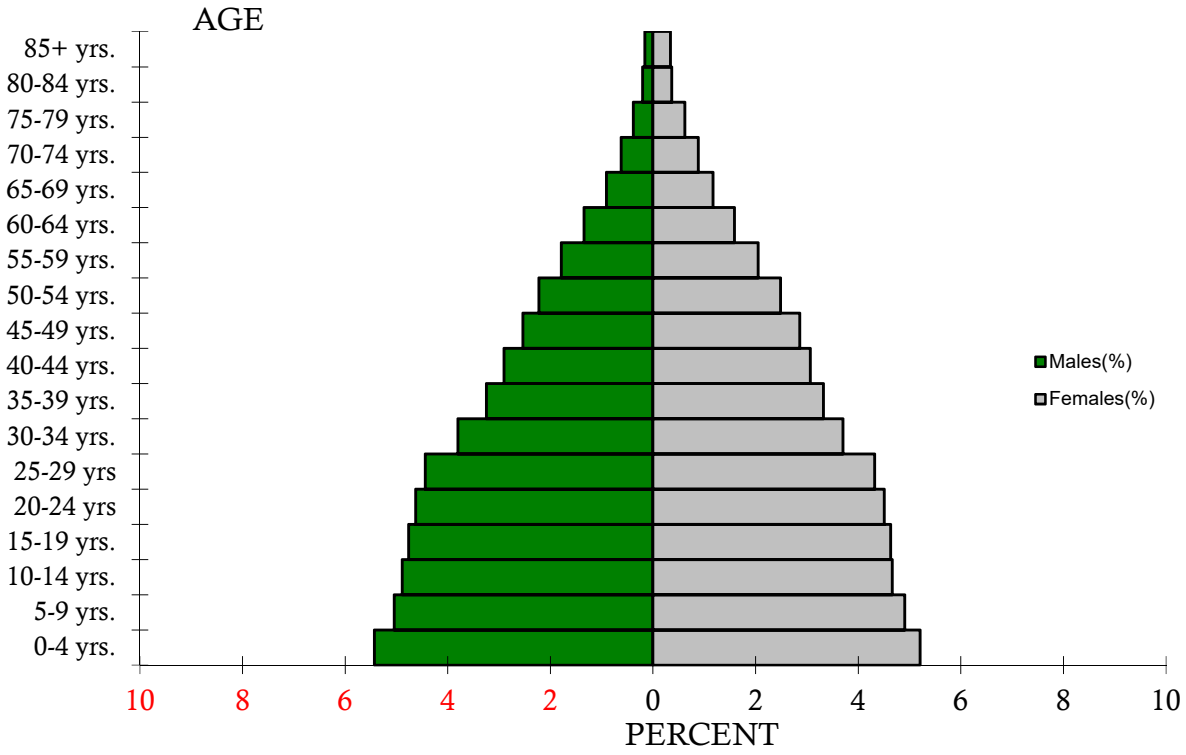
The project falls within the Hantam Local Municipality which is located within the Namakwa District Municipality of the Northern Cape Province. The demographics pertaining to the provincial and municipal areas, as sourced from Statistics South Africa, are described below.

1.1. PROVINCIAL

The Northern Cape is the largest and most sparsely populated of all provinces in South Africa and shares borders with the following provinces:

- North West – northeast
- Free State – east
- Eastern Cape – southeast
- Western Cape – south and southwest.

The province covers a geographical area of 372 889 km² and, with a population of 1 145 861 people in 2011, had a population density of 3.1 people per km² (Statistics South Africa, 2011). By mid-2020 the population of the Northern Cape was estimated at 1 292 789 (Statistics South Africa, 2020a). As the Mid-year population estimates remain at a provincial level and are not projected to the district and local municipal levels, for comparative purposes, data gathered during Census 2011 and Community Survey 2016, will be used where appropriate notwithstanding it being somewhat outdated. On this basis, in respect of age structure, 36% (36% in 2016) of the population of the Northern Cape were below 18 years while 59% (58% in 2016) were between 18 and 64 years of age and 6% (7%) were above 64 years in 2011. The population pyramid of the Northern Cape Provinces is illustrated in **Figure 2**.



Source: (Statistics South Africa, 2011)

Figure 2: Population pyramid Northern Cape Province

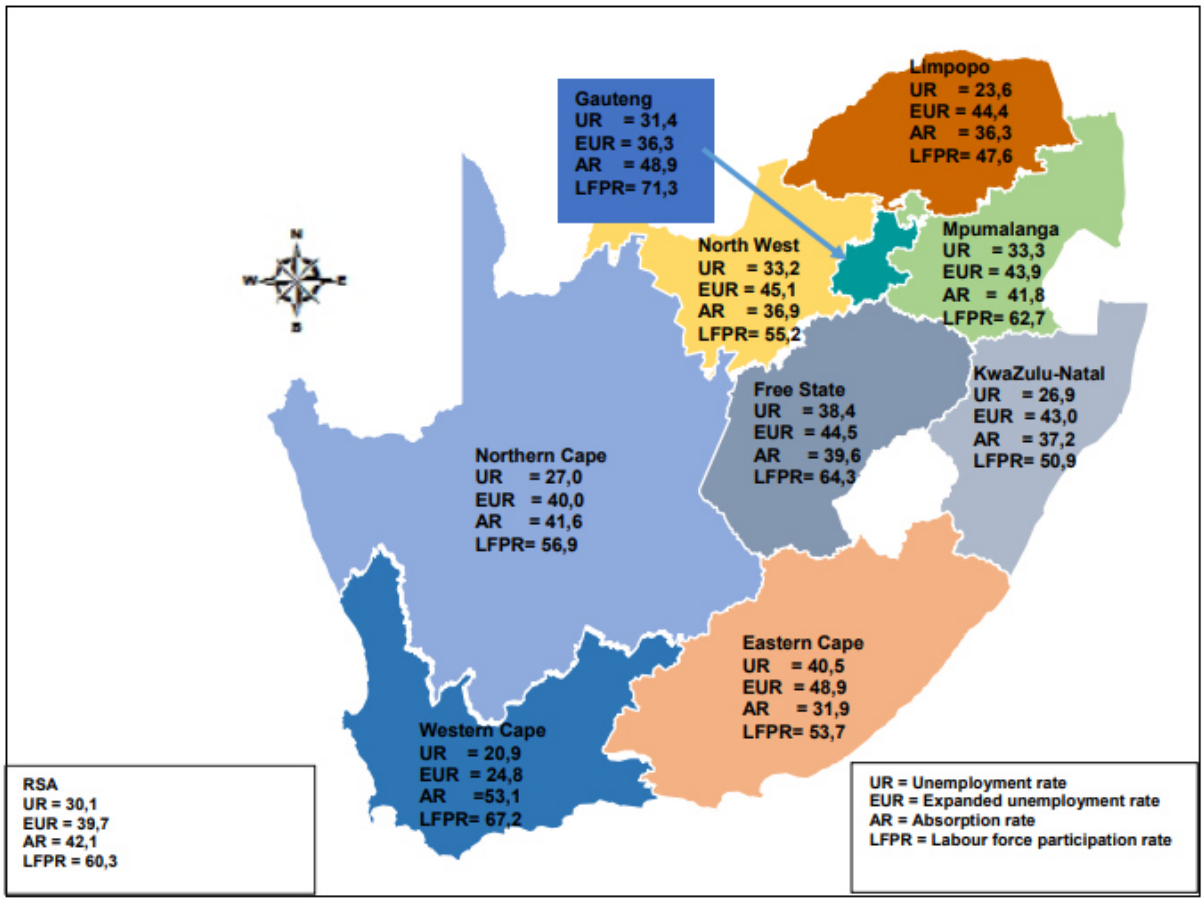
In respect of population grouping, the dominant population group in the Northern Cape are black African people at 50.4% (48.1% in 2016) followed by coloured people at 40.3% (43.7% in 2016), white people at 7% (8% in 2016) with Indian or Asian people accounting for 1% (1% in 2016) of the population. The majority of this population, 52.9% (55.7% in 2016),

speak Afrikaans followed by Setswana at 32.6% (32.7% in 2016) and isiXhosa at 5.3% (5.1% in 2016).

In 2011 the official unemployment rate in the Northern Cape was 27.4% with the official unemployment rate amongst the youth, aged between 15 and 34 years, coming in at 34.5%. In the 1ST Quarter of 2020, the official unemployment rate in the province was 27%. These figures must, however, be considered with caution as the official unemployment rate is defined by Stats SA as follows:

> "*Unemployed persons are those (aged 15–64 years) who:*
> *a) Were not employed in the reference week and;*
> *b) Actively looked for work or tried to start a business in the four weeks preceding the survey interview and;*
> *c) Were available for work, i.e. would have been able to start work or a business in the reference week or;*
> *d) Had not actively looked for work in the past four weeks but had a job or business to start at a definite date in the future and were available.*" (Statistics South Africa, 2020b, p. 18).

In the first quarter of 2020 the expanded unemployment rate of the Northern Cape stood at 40.0%; the labour absorption rate at 48.9% and the labour force participation rate at 56.9%. A summary of the labour market indicators illustrated on a comparative basis across South Africa is provided in **Figure 3**.



Source: (Statistics South Africa, 2020b, p. 10)

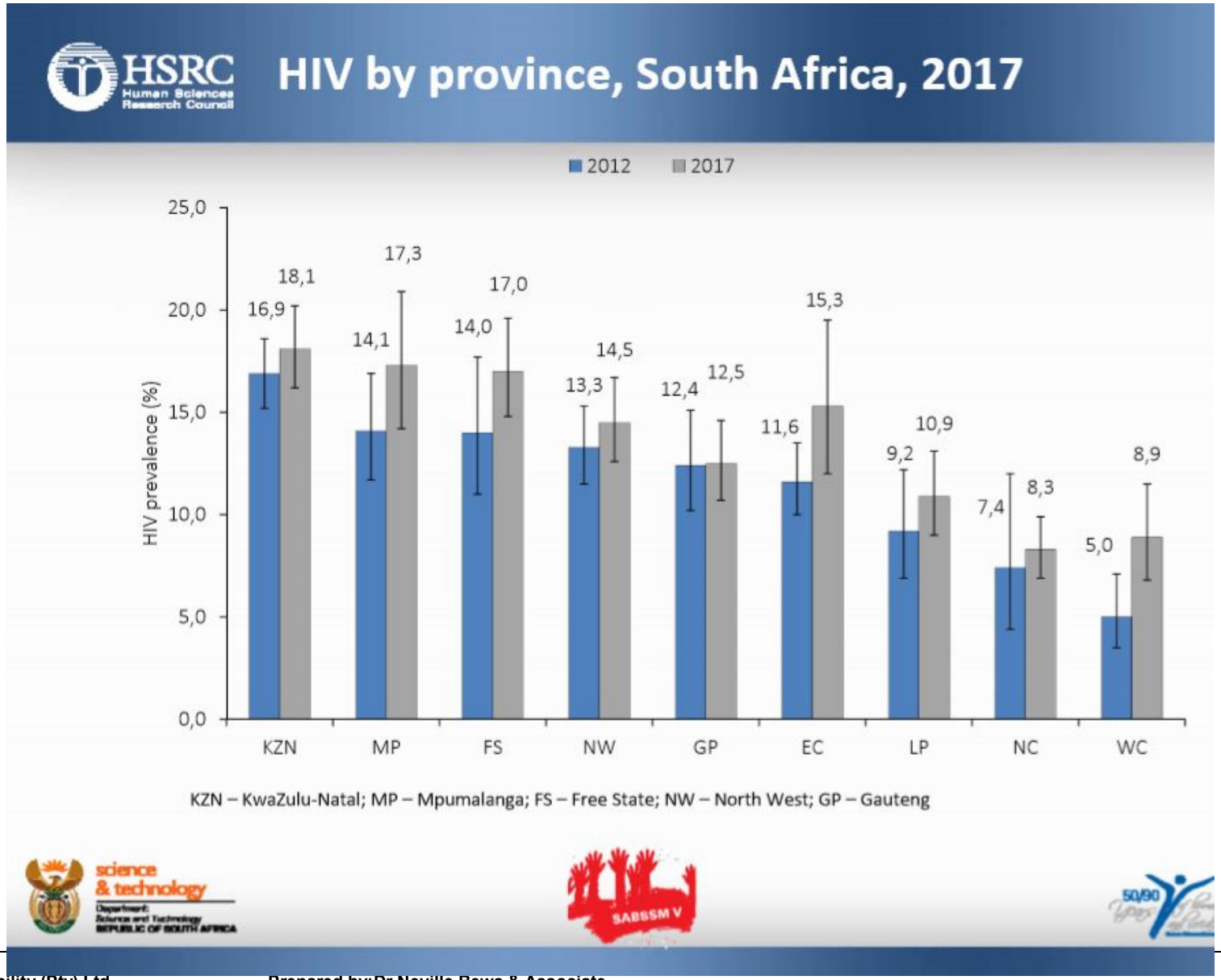
Figure 3: Labour market indicators 1st Quarter 2020

In respect of households, the 2011 Census indicated that there were 313 402 (353 713 in 2016) households in the Northern Cape. Of these households 38.5% were female-headed, 12.6% lived in informal dwellings and 53% either owned or were paying off their dwelling.

Regarding household services in 2011, 60.1% of households in the Northern Cape had flush toilets connected to the sewerage system, 64.0% had their refuse removed weekly, 45.8% had piped water delivered inside the dwelling and 85.4% used electricity as a means of energy for lighting.

Concerning HIV prevalence the Northern Cape had the lowest prevalence rate across South Africa at 8.3% in 2017 followed by the Western Cape with a prevalence rate of 8.9%. KwaZulu-Natal, with a prevalence rate of 18.1% had the highest rate with the national HIV prevalence rate at 14.0% in 2017. HIV prevalence rate between 2012 and 2017 as it stood across all South African provinces is illustrated in **Figure 4**.

The 2017 National Antenatal Sentinel HIV Survey extended to the district level which indicated that, at the time the survey was undertaken, the Namakwa district had the highest HIV prevalence rate in the province at 22.3% and the Namakwa district had the lowest rate at 8.5% The incidence of HIV prevalence as it occurred between 2012 and 2017 across the Northern Cape is illustrated in **Table 1** (Woldesenbet, et al., 2019, p. 91).


HSRC
Human Sciences Research Council
HIV by province, South Africa, 2017
2012
2017
HIV prevalence (%)
25,0
20,0
15,0
10,0
5,0
0,0
16,9
18,1
14,1
17,3
14,0
17,0
13,3
14,5
12,4
12,5
11,6
15,3
9,2
10,9
7,4
8,3
5,0
8,9
KZN
MP
FS
NW
GP
EC
LP
NC
WC
KZN – KwaZulu-Natal; MP – Mpumalanga; FS – Free State; NW – North West; GP – Gauteng
science & technology
SABSSM V

Source: (Simbayi, et al., 2019)

Figure 4: HIV by province – South Africa 2012 – 2017

Table 1: HIV prevalence by district in the Northern Cape Province; 2012 – 2017

District	2012		2013		2014		2015		2017	
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI
F. Baard	23.0	18.5 – 28.2	18.2	14.7 – 22.3	19.5	14.5 – 25.6	24.3	20.6 – 28.3	22.3	18.0 – 27.2
J. T. Gaetsewe	14.8	10.4 – 20.5	23.2	17.0 – 30.8	18.5	12.5 – 26.4	21.9	15.1 – 30.7	18.7	15.3 – 22.8
Namakwa	1.5	0.2 – 10.2	2.3	0.5 – 9.1	3.6	1.2 – 10.5	2.9	0.7 – 11.8	8.5	4.2 – 16.5
Namakwa	18.4	12.7 – 25.9	15.1	9.4 – 23.4	13.6	9.1 – 19.7	15.8	10.0 – 23.9	16.7	12.6 – 21.8
Z. F. Mgcawu	14.3	9.8 – 20.4	20.1	14.3 – 27.5	14.8	9.8 – 21.8	14.5	9.2 – 22.2	16.1	12.1 – 21.1
Northern Cape	**17.8**	**15.3 – 20.7**	**17.5**	**15.0 – 20.4**	**16.1**	**13.5 – 19.2**	**19**	**16.3 – 22.0**	**17.9**	**16.0 – 20.1**

Source: (Woldesenbet, et al., 2019, p. 82)

Attention is now turned towards a demographic describing of the municipalities and small area affected by the project.

1.2. MUNICIPAL

Namakwa District Municipality (DC7): The district covers an area of 103 409.91 km^2 and incorporates the following four local municipalities:

- Hantam Local Municipality
- Kamiesberg Local Municipality
- Karoo Hoogland Local Municipality
- Khai-Ma Local Municipality
- Nama Khoi Local Municipality
- Richtersveld Local Municipality

The following towns are also located within the Namakwa District Municipality:

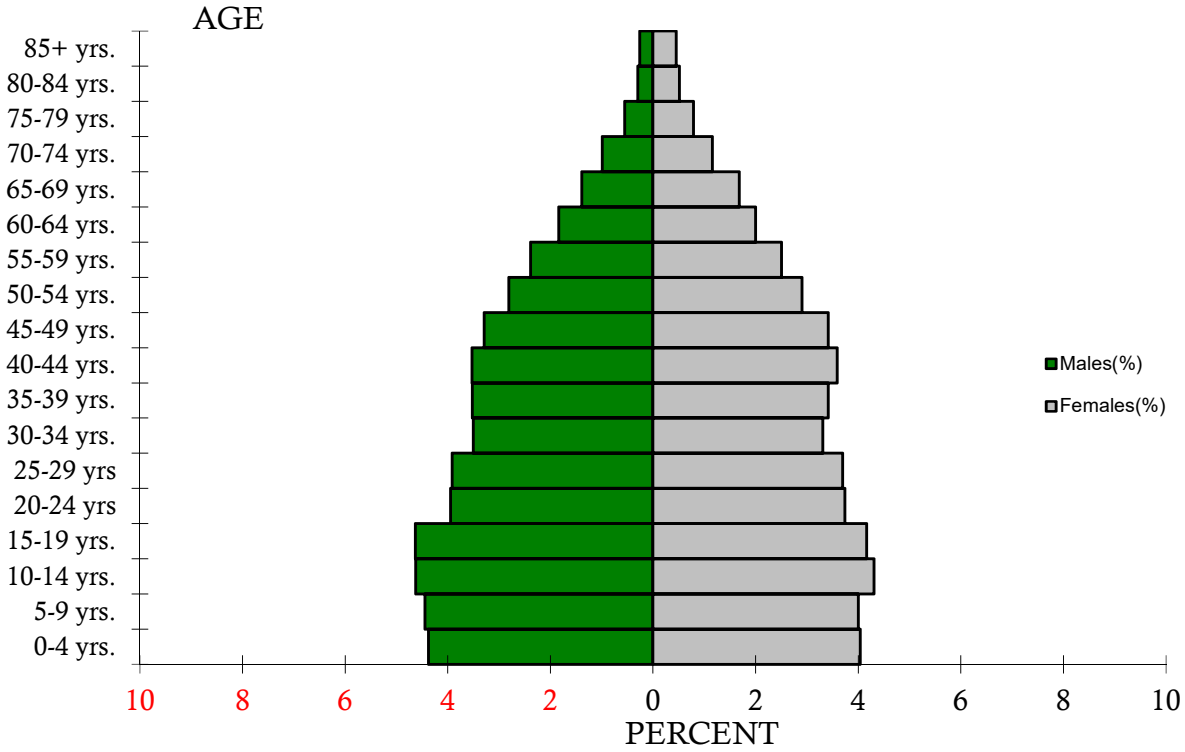
Aggeneys	Alexander Bay	Brandvlei	Bulletrap,
Calvinia	Carolusberg	Concordia	Eksteensfontein
Frasersburg	Garies	Hondeklip Bay	Kamieskroon
Kleinzee	Koingnaas	Kuboes	Leliefontein/Kamiesberg
Loeriesfontein	Middelpos	Nababeep	Nieuwoudtville
O'Kiep	Onderste Doorns	Pella	Port Nolloth
Richtersveld	Sanddrift	Springbok	Steinkopf
Steinkopf	Sutherland	Williston	

The main economic sectors of the district include:

- Agriculture

- Tourism.

With a population of 115 842 people, the Namakwa DM has a population density of 0.91/km^2. According to Census, 2011 the district has a sex ratio of 101.2 with 25.8% of the population being under 15 years; 66.1% being between 15 and 65 years and 8.1% being over 65 years of age. The population pyramid of the Namakwa District Municipality is illustrated in **Figure 5**.



Source: (Statistics South Africa, 2011)

Figure 5: Population pyramid Namakwa District

The demographic data pertaining to the Namakwa District Municipality, based on both Census 2011 and Community Survey 2016, is presented below.

	Community Survey 2016	**Census 2011**
Population	**115 488**	**115 842**
Age Structure		
Population under 15	22.5%	25.8%
Population 15 to 64	68.0%	66.1%
Population over 65	9.5%	8.1%

	Community Survey 2016	Census 2011
Dependency Ratio		
Per 100 (15-64)	47.1	51.2
Sex Ratio		
Males per 100 females	101.5	101.2
Population Growth		
Per annum	-0.07%	n/a
Labour Market		
Unemployment rate (official)	n/a	20.1%
Youth unemployment rate (official) 15-34	n/a	25.4%
Education (aged 20 +)		
No schooling	4.4%	6.6%
Matric	24.2%	18.8%
Higher education	8.0%	7.4%
Household Dynamics		
Households	37 669	33 856
Average household size	3.1	3.2
Female headed households	37.6%	36.6%
Formal dwellings	95.2%	93.8%
Housing owned	72.6%	60.1%
Household Services		
Flush toilet connected to sewerage	67.9%	57.9%
Weekly refuse removal	81.7%	80.1%
Piped water inside dwelling	70.5%	63.3%
Electricity for lighting	88.4%	86.5

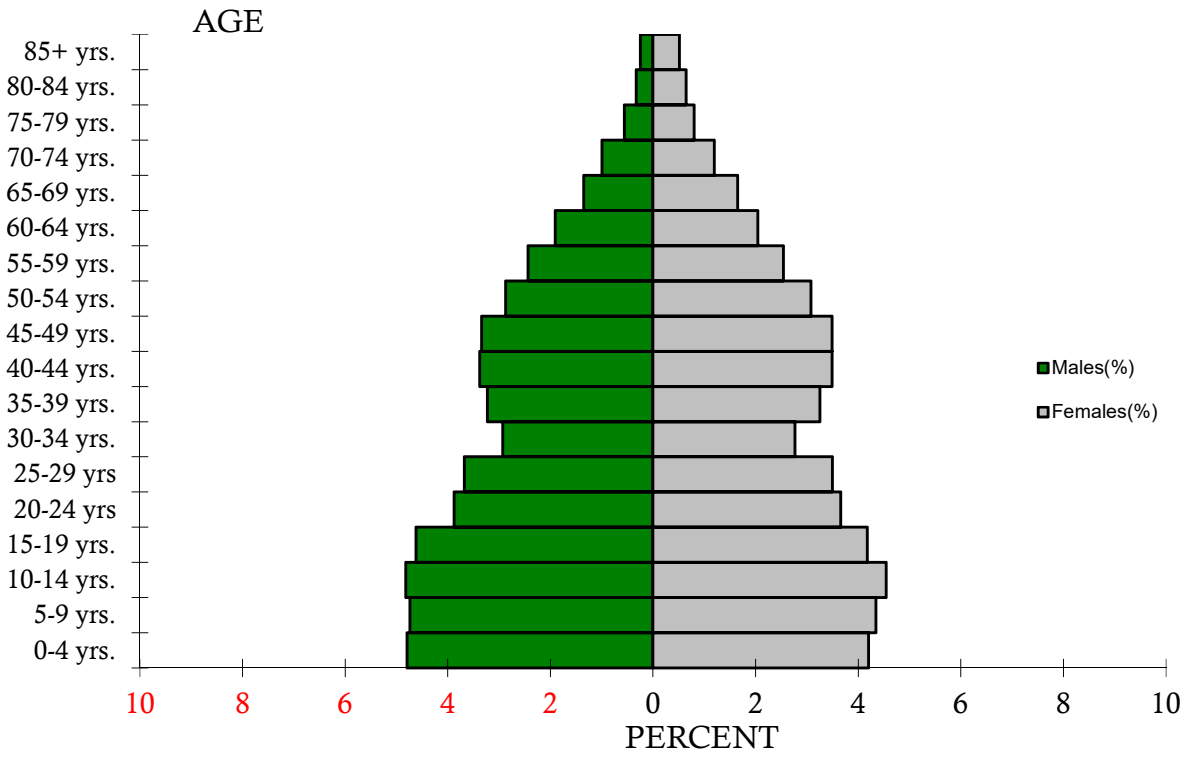
Hantam Local Municipality: Hantam covers a geographical area of 39 085 km^2 and incorporates the town of:

- Brandvlei
- Calvinia
- Loeriesfontein
- Middelpos
- Nieuwoudtville and

- Onderste Doorns.

Agriculture is the main economic driver in the municipality.

With a population of 21 684 people, the Hantam LM has a population density of 0.55/km^2. According to Census, 2011 the municipal area has a sex ratio of 100.4 with 27.4% of the population being under 15 years; 64.3% being between 15 and 65 years and 8.3% being over 65 years of age. The population pyramid of the Hantam Local Municipality is illustrated in **Figure 6**.



Source: (Statistics South Africa, 2011)

Figure 6: Population pyramid Hantam Local Municipality

The demographic data pertaining to the Hantam Local Municipality, based on both Census 2011 and Community Survey 2016, is presented below:

	Community Survey 2016	**Census 2011**
Population	21 540	21 684
Age Structure		
Population under 15	24.2%	27.4%
Population 15 to 64	66.9%	64.3%

	Community Survey 2016	Census 2011
Population over 65	8.9%	8.3%
Dependency Ratio		
Per 100 (15-64)	49.6	55.5
Sex Ratio		
Males per 100 females	101.9	100.4
Population Growth		
Per annum	-0.15%	n/a
Labour Market		
Unemployment rate (official)	n/a	n/a
Youth unemployment rate (official) 15-34	n/a	n/a
Education (aged 20 +)		
No schooling	9.9%	13.9%
Matric	24.7%	18.2%
Higher education	8.0%	7.7%
Household Dynamics		
Households	6 894	6 392
Average household size	3.1	3.2
Female headed households	34.1%	33.4%
Formal dwellings	94.8%	96.9%
Housing owned	67.6%	53.8%
Household Services		
Flush toilet connected to sewerage	78.3%	53.4%
Weekly refuse removal	76.2%	72.0%
Piped water inside dwelling	65.7%	59.8%
Electricity for lighting	80.9%	76.3%

1.3. PROJECT FOOTPRINT

At a more project-specific footprint level the project is located within the Hantam Non-Urban (NU) area, Main Place 366002 (Census, 2011). The area is sparsely populated having a population density of 0.12 people per square kilometre. The demographic data in respect of this area is as follows:

Total population	4,175
Young (0-14)	21,3%
Working Age (15-64)	70,9%
Elderly (65+)	7,9%
Dependency ratio	41,1
Sex ratio	124,8
Population density	0.12 persons/km^2
No schooling aged 20+	19,1%
Higher education aged 20+	9,4%
Matric aged 20+	13,2%
Number of households	1,721
Average household size	2,3
Female headed households	10,9%
Formal dwellings	96,5%
Housing owned/paying off	26,1%
Flush toilet connected to sewerage	27,8%
Weekly refuse removal	6,2%
Piped water inside dwelling	44,5%
Electricity for lighting	32,2%

6. IDENTIFICATION AND ASSESSMENT OF IMPACTS

In 2015 Urban-Econ Development Economists undertook a social impact assessment for the Dwarsrug Wind Farm. The project subsequently received environmental authorisation under the following authorisation number 14/12/16/3/3/2/690. Through their assessment, Urban-Econ Development Economists identified the following social impacts and attached the following rating to these impacts (Urban-Econ Development Economists, 2015, p. 71).

Impact	Nature	Pre mitigation significance	Post mitigation significance
Construction phase assessment results			
Temporary increase in production	Positive	High (54)	High (54)
Temporary stimulation of GDP-R	Positive	High (54)	High (54)
Temporary employment creation	Positive	High (54)	High (54)
Increased household income and standard of living	Positive	High (54)	High (54)
Skills development	Positive	Medium (45)	Medium (48)
Increase in government revenue	Positive	Low (18)	Low (18)
Agricultural activities in the zone of influence due to movement of vehicles and workers	Negative	Low (10)	Low (10)
Change in demographics of the area	Negative	Medium (30)	Low (28)
Increase in social pathologies	Negative	Medium (48)	Medium (45)
Deterioration of living and working conditions	Negative	Low (14)	Low (14)
Added pressure on infrastructure	Negative	Medium (45)	Medium (30)
Operational phase assessment results			
Sustainable increase in production	Positive	High (40)	High (40)
Sustainable increase in GDP-R	Positive	High (40)	High (40)
Creation of long-term employment opportunities	Positive	High (40)	High (40)
Increased household income and standard of living	Positive	High (40)	High (40)
Skills development	Positive	Low (17)	Low (18)
Sustainable increase in government revenue stream	Positive	Low (19)	Low (19)
Investment in local communities due to SED and ED	Positive	Medium (34)	Medium (34)
Impact on property and land value	Positive	Low (11)	Low (11)

Considering this and the nature of the project in that:

- It will be a component of an existing approved facility.
- To reduce electrical losses, the location is restricted to within close proximity to the approved substation.
- A ~5 ha study site has been established around the approved substation (500 m zone) allowing for micro siting/specialist guidance regarding the placement to be made.

It is unlikely that the project will result in any additional negative social impacts over both the construction and operational phases. The scale of the project is also small and therefore it is also most unlikely that it will result in any additional negative cumulative social impacts within the immediate area.

It is apparent that the project will have significant social benefits at a regional, and probably also at a national level. The project aims to install and operate a BESS that will store energy collected via the renewable energy facility during off-peak periods, making it available during periods of high demand. In addition, the BESS will increase the efficiency, reliability and consistency of energy supply by storing energy that can bridge those periods when the renewable energy facility is forced to run below capacity due to weather or for maintenance reasons.

6.1 Planning / Pre-construction Impacts

Due to the nature and magnitude of the project, there is unlikely to be any planning or pre-construction social impacts associated with the BESS.

6.2 Construction Impacts

Construction will be limited in extent and duration, so the proposed project is most unlikely to result in any significant construction-related social impacts.

6.3 Operational Impacts

The operation of the proposed project will fall within the context of the operation of the existing approved Dwarsrug Wind Energy Facility (WEF). In this sense, it is most unlikely that it will increase the significance of the impacts identified and assessed by Urban-Econ Development Economists. It is also most unlikely that the project will result in any additional negative social impacts as those identified by Urban-Econ Development Economists.

What is, however, significant is the social benefit that the project will have in respect of the security of electricity supply. In this regard, it will have an indirect social benefit associated with:

- Increased business confidence
- Reduced health and safety risks and
- A reduction in the nuisance factors.

These impacts are assessed in **Table 2**.

6.4 Decommissioning Impacts

Decommissioning will either be undertaken as part of the maintenance and upgrade of the existing Dwarsrug Wind Energy Facility, or as part of the decommissioning of the entire facility at end of life. Either way, there will be a long period before decommissioning which makes it difficult to assess with any degree of accuracy due to the dynamic nature of the social environment.

6.5 Cumulative Impacts

Due to the nature and extent of the proposed project, it is most unlikely to result in any significant negative cumulative social impacts. The project will be contained to the existing approved site over both the construction and operational phases.

With several renewable energy facilities installing BESS there is, however, likely to be a positive cumulative social impact regarding the security of energy supply. The indirect consequences of this, which are likely to extend to the national level, will result in:

- Increased business confidence
- Reduced health and safety risks
- A reduction in the nuisance factors.

These impacts are assessed in **Table 2**.

6.6 Overall Impact Rating

The overall impact rating scale against which the social impacts are assessed was provided by SiVEST Environmental and is attached as Appendix 1. It must be noted that this rating scale is generic because it applies across disciplines. Because of the vague nature of many of the social issues, and that they are often based on perceptions, it is difficult to apply this scale in respect of many of the social impacts. Also, the rating scale is phrased in a negative tone, making it rather difficult to assess the positive impacts, so where applicable, the scale was inverted.

7. ALTERNATIVES

No site alternatives for this proposed development were considered as placing the proposed BESS depends on the location of the Dwarsrug Wind Energy Facility (WEF) (14/12/16/3/3/2/690).

Technology alternatives are limited to battery types, namely Redox flow batteries and Solid-State Batteries. No other activity alternatives are being considered.

7.1 No-Go Alternative

The 'no-go' alternative is the option of not constructing and operating a BESS in support of the authorised Renewable Energy (RE) facility. It is most unlikely that this option would have any significant social impacts in respect of constructing and operating the Dwarsrug Wind Energy Facility as the facility is already operational, and the construction and operation of a BESS are likely to result in minimal social impacts.

What is, however, significant is that the 'no-go' alternative will compromise the potential efficiency and reliability of the Dwarsrug Wind Energy Facility in that it will lack the capacity to store energy during off-peak periods to be used during periods of peak demand. On a social basis, this will have a significant negative effect in that a less efficient, reliable and consistent supply of electricity will have economic, health and safety and nuisance consequences. Economic in that disruptive electricity supply seriously undermine business confidence. Health and safety risks in respect of disrupted medical/surgical procedures and

treatment and increased safety risk to motorists, pedestrian and the general public due to road traffic signalling outages and other public safety issues. Nuisance factor can range from disrupted entertainment, inability to use power tools and computers to missed appointments due to traffic congestion. All of this will have negative social impacts and could result in increased stress levels as well as, increased public health, and safety risks. Considering the issues discussed above, the 'no-go' option is assessed in **Table 2**.

Table 2: Rating of impacts

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									RECOMMENDED MITIGATION/MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION								
		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S
Construction Phase																				
Construction will be limited in extent and duration, so the proposed project is most unlikely to result in any significant construction-related social impacts.																				
Operational Phase																				
Efficient, reliable and consistent supply of electricity	Increased business confidence	4	3	3	3	3	4	64	+	Very High	Ensure that the appropriate agreements are in place to enforce performance and availability compliance. Attach non-compliance penalties to encourage reliability of supply.	4	3	3	3	3	4	64	+	Very High
	Reduced health and safety risks	4	3	3	3	3	4	64	+	Very High		4	3	3	3	3	4	64	+	Very High
	A reduction in the nuisance factors	4	3	3	3	3	4	64	+	Very High		4	3	3	3	3	4	64	+	Very High
Decommissioning Phase																				
Either way, there will be a long period before decommissioning which makes it difficult to assess with any degree of accuracy due to the dynamic nature of the social environment.																				
Cumulative Impacts																				
Efficient, reliable and consistent supply of electricity	Increased business confidence	4	3	3	3	3	4	64	+	Very High	Ensure that the appropriate agreements are in place to enforce performance and availability compliance. Attach non-compliance penalties to encourage reliability of supply.	4	3	3	3	3	4	64	+	Very High
	Reduced health and safety risks	4	3	3	3	3	4	64	+	Very High		4	3	3	3	3	4	64	+	Very High
	A reduction in the nuisance factors	4	3	3	3	3	4	64	+	Very High		4	3	3	3	3	4	64	+	Very High

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									RECOMMENDED MITIGATION/MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION								
		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S
'No-go' Impacts																				
Efficient, reliable and consistent supply of electricity	Increased business confidence	4	3	3	3	3	4	64	-	Very High	The only mitigation measure would for the project to proceed as planned	4	3	3	3	3	4	64	-	Very High
	Reduced health and safety risks	4	3	3	3	3	4	64	-	Very High		4	3	3	3	3	4	64	-	Very High
	A reduction in the nuisance factors	4	3	3	3	3	4	64	-	Very High		4	3	3	3	3	4	64	-	Very High

8. CONCLUSION

It is apparent that the project will have significant social benefits at a regional, and probably also at a national level. The project aims to install and operate a BESS that will store energy collected via the renewable energy facility during off-peak periods, making it available during periods of high demand. Besides, the BESS will increase the efficiency, reliability and consistency of energy supply by storing energy that can bridge those periods when the renewable energy facility is forced to run below capacity due to weather or maintenance reasons.

The objective of the proposed development is to ensure that the Dwarsrug Wind Energy Facility (WEF) can store and integrate a greater amount of renewable energy into the National Grid. This is important for the facility to be more efficient and reliable and to deliver a more consistent supply of electricity.

The BESS will be located adjacent to the approved Dwarsrug WEF substation associated with the approved Dwarsrug WEF. Consequently, it is most unlikely that the proposed project will increase the significance of the impacts identified and assessed by Urban-Econ Development Economists; or result in any additional impacts. It is clear, however, that the project has the potential to increase the efficiency, reliability and consistency of the electricity delivered by the Dwarsrug WEF. This will have a positive impact regarding business confidence, public health and safety and the nuisance factor associated with frequent electricity outages.

8.1 Impact Statement

Considering all social impacts associated with the project, it is evident that the positive elements outweigh the negative and that the project carries with it significant social benefits. In addition, the project fits with international and governmental policy and legislation. Consequently, the proposed installation of a BESS at the authorised Dwarsrug Wind Energy Facility (WEF) (14/12/16/3/3/2/690) is supported at the social level and no further assessment would be required.

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