Activity 2: Area intelligence for year 1 (Phola)

Area intelligence Report for year 1 (baseline)

Document by:

ARM
AIR RESOURCE MANAGEMENT

Final Report

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ANC	African National Congress
AQA	Air Quality Act
AQMP	Air Quality Management Plan
ARM	Air Resource Management
BNG	Breaking New Grounds
CBO	Community-Based Organization
DEFF	Department of Environment Forestry and Fisheries
ELM	eMalahleni Local Municipality
IDP	Integrated Development Plan
KPA	Key Performance Area
LM	Local Municipality
MES	Minimum Emission Standards
NACA	National Association for Clean Air
NDP	Net Domestic Product
NGO	Non-Governmental Organisation
NDM	Nkangala District Municipality
NSDP	National Spatial Development Perspective
PESTLE	Political, Economic, Social, Technological, Legal and Environmental
PM	Particulate Matter
PMV	Planning, Monitoring and Verification
SDF	Spatial Development Framework
SWOT	Strengths, weaknesses, opportunities, and threats

1. EXECUTIVE SUMMARY

1.1 STUDY OBJECTIVE

Eskom is pursuing a multi-pronged approach to improving ambient air quality, including reducing emissions at the existing coal-fired fleet, investing in power generation from renewables and nuclear, and implementing air quality offsets. As part of phase 2 of the Eskom's Air Quality Offset (AQO) programme, Phola has been identified as the focus of Kendal Power Station's AQO Intervention. Eskom appointed Air Resource Management (Pty) Ltd (herein referred to as ARM) to support the Planning, Monitoring and Verification (PMV) services in support of the Phase 2 AQO implementation at Phola. Eskom has included eight targeted work package activities for the Phola community.

This report is an output of Activity 2: Area Intelligence for Phola. The objective of this area intelligence report is to provide a better understanding of the study area, including environmental and socioeconomic aspects that presents threats and opportunities to the successful implementation of offsets.

1.2 STUDY APPROACH

For the study both high level regional, social and local geographical information & development plans conducted in Phola were collated. This information was subsequently analysed and synthesised. Thereafter a SWOT and PESTLE analysis was undertaken. Figure 1 illustrates the study approach undertaken herein. The process flow for the study approach serves as an effective methodology for collecting and synthesizing information about Eskom's Air Quality Offset programme, offering a structured way to organize relevant intelligence that will guide Eskom's Air Quality Offset strategies. Stage 1 presents the data collection process based on existing information and a review of available literature, Stage scrubs and organises the information for further analysis, Stage 3 analyses and synthesises the information into useful data sets for Eskom's air quality offset programmes, Stage 4 presents the diagnosis and predictive analysis identifying future trends based on the available information and Stage 5 is a prescriptive analysis of aspects that must be continuously monitored in future.

1 Document Collection	2 Review and Synthesis	3 Threats and Opportunities	4 Recommendations	5 Continuous Monitoring
Collation of relevant documentation	Review and Synthesis of documents to identify salient features in relation to offsets	Identification of threats and opportunities to the offset project.	Make recommendations to minimise threats and maximise opportunities.	Identify aspects to be monitored on a continuous basis throughout the project.

Figure 1: Area Intelligence assessment study process flow

1.2.1 Phola In The News

ARM presents below some of the latest topical news affecting Phola in order to contextualise the Eskom AQO project and potential issues that may have to be addressed. The newspaper snippets below are taken from actual newspaper articles. The Phola community is evidently dissatisfied with the existing pollution levels and their impact on health. In light of this situation, Eskom should adopt a more cautious approach when interacting with the community regarding offset initiatives. Despite the negative context of air pollution from various industrial sectors, the offsetting initiative offers a positive narrative

Friday
December 13
2024

PHOLA NEWS

Latest news and bulletin updates

SOWETAN, 11 JULY 2019

Mpumalanga residents shut down mine

Residents of Phosa and Ogies in eMalahleni, Mpumalanga, have stopped operations at one of Glencore's mines after accusing it of reneging on its promise to offer them employment opportunities.

LUCAS LEDWABA, 09 JUNE 2021

'These mines are killing us polluting the air'

Phola, near the town of Ogies on the Mpumalanga highveld, is an area notorious for high levels of air pollution. The township is surrounded by coal mines and coal-fired power stations, placing it in the literal eye of the air pollution storm.

Phola youngsters dedicate themselves to sport activities to escape social ills, Youngsters from Phola on the outskirts of eMalahleni in Mpumalanga have...

HIGHVELD CHRONICLE, JUNE 2024

Phola residents desperate for new community hall amid 'nyaope crisis'

Burning tyres barricade the main road at Phola during a protest

GROUNDUP

Disease haunts Mpumalanga coal tow

Many of the residents complain that they are breathing dust stirred up by the blasting and ash dumps from Eskom power stations, creating respiratory conditions for those living nearby.

SABC NEWS, 10 DECMEBER 2022

Local resident in Mpumalanga reject transition dialogue by the Mineral Resources and Energy Department

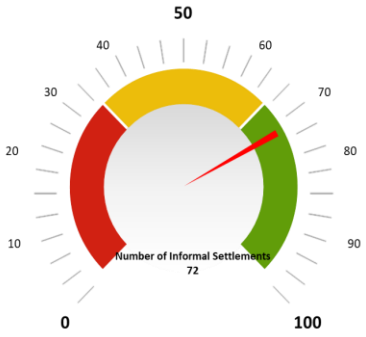
Residents of Emalahleni, Phola and Kriel in Mpumalanga have rejected the just transition dialogue by the Mineral Resources and Energy Department. It was held at the Matla Coal Multipurpose Hall outside Kriel. The residents say the country is not ready to move from coal to renewable energy

.

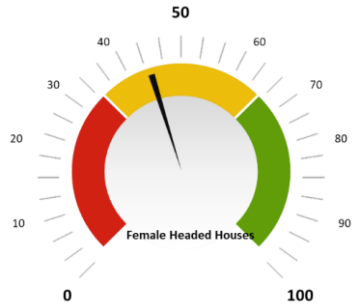
1.2.2 EMALAHLENI / PHOLA KEY STATISTICS

The dashboard below presents an overview of essential statistics sourced primarily from Stats SA for Phola. Notable figures reveal an unemployment rate of 29% and a rapidly growing youth demographic comprising 43% of the population. Additionally, female-headed households are estimated to account for 43%. A crucial factor for the success of Eskom's air quality offset program will be the inclusion of youth and women in its framework.

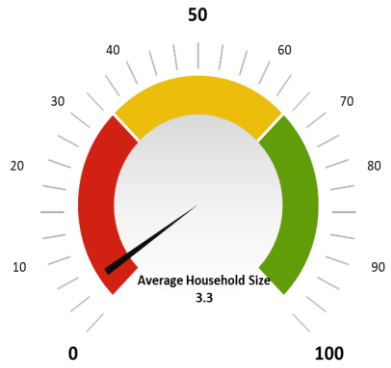
Unemployment Rate – 29%



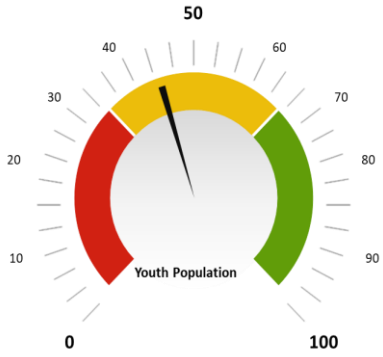
Informal Settlements – 72



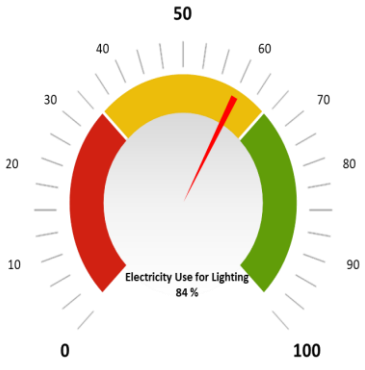
Female Headed Houses – 43%



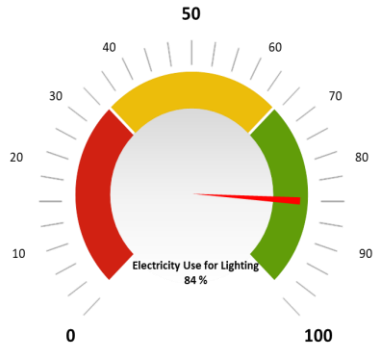
Household size – 3.3



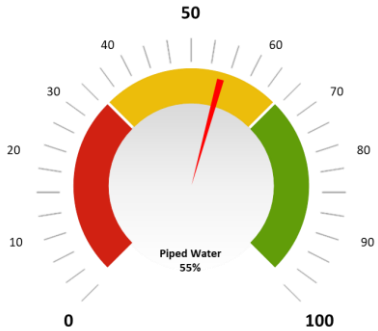
Youth Population – 43%



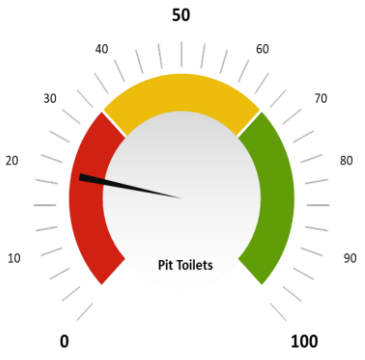
Electricity for cooking – 60%



Electricity for lighting– 84%



Piped Water – 55 %



Pit Toilets – 18 %

1.3 STUDY RESULTS

A significant portion of the document is dedicated to gathering regional and area intelligence. This involves an analysis of socioeconomic and environmental factors in Phola to identify threats and opportunities for successful project implementation. Insights drawn from local development plans (IDPs), community needs, and stakeholder engagements point to critical challenges such as high unemployment rates, inadequate infrastructure, and the over-reliance on coal mining.

Key findings highlight that Phola operates within a dynamic but constrained context due to its historical dependence on coal mining. Despite opportunities for renewable energy development and economic diversification, the community faces substantial social struggles, including poverty, a burgeoning youth population, high unemployment, limited access to essential services, and rising crime rates, which complicate the rollout of sustainable air quality offset initiatives.

The report concludes with a SWOT analysis and PESTLE evaluation of the current landscape, projecting both the potential and risks associated with the offset programs. Critical stakeholders, including local government, mining and other industrial companies, community organizations, and environmental groups (NGOs), are identified as influential in shaping the offset development framework. These insights are expected to guide Eskom and other stakeholders in effectively implementing air quality offsets that align with regulatory obligations while enhancing community resilience and environmental health.

The comprehensive assessment underscores the need for continuous stakeholder engagement to ensure alignment between the air quality offset project objectives, community priorities, and environmental sustainability. As the region adapts to a shifting energy landscape, the proactive measures identified in this plan could enhance public health outcomes and contribute to sustainable offset initiatives.

1.3.1 STAKEHOLDER MAP

ARM undertook a stakeholder mapping exercise, to identify the key stakeholders operating in Phola. Community and NGOs especially Environmental groups such as the Vaal Environmental Justice Alliance (VEJA) are high prevalent and active in the Highveld because of its classification

as a priority area. Eskom will need to engage and closely manage these stakeholder needs during the development and execution of the offset projects.

1.3.2 SWOT ANALYSIS

The SWOT analysis (Chapter 8) conducted for eMalahleni identifies the key strengths, weaknesses, opportunities and threats and by inference also for Phola. The key threats that could be an impediment for Eskom's air quality offsets are a growing youth population, high unemployment and high crime rates. Eskom can leverage opportunities like the availability of agricultural land and solar energy potential to address these challenges by integrating innovative solutions into their air quality offset programs. Although Eskom's current air quality offsets primarily focus on household initiatives, they might need to pivot towards renewable energy mini and micro grids to help communities reduce their reliance on coal for cooking and heating. This approach would also create job opportunities, benefiting both the youth and women by facilitating their entry into the formal economy.

SWOT	Description
Strengths	• Abundant Natural Resources such as coal • Strategic geographical location – major transport corridor • Industrial and mining industries • Seat of "Power" stations • Local workforce and skills
Weakness	• Over reliance on traditional industries • Limited economic diversification • Infrastructure gaps, unreliable • Weak Governance
Opportunities	• Land available for agriculture and agribusiness • Grow the renewable energy sector • Tourism industry potential
Threats	• Concentrated economy susceptible to economic downturn • Environmental pressure • High youth population • High unemployment rate • High crime

1.4 CONCLUSION

In conclusion, the Stakeholder Mapping and SWOT analysis for eMalahleni, along with its implications for Phola, sheds light on the multifaceted landscape that Eskom must navigate in its efforts to implement effective air quality offsets. The identification of key strengths provides a foundation for leveraging community assets, while the weaknesses highlighted point to areas requiring strategic intervention. However, the primary concerns stemming from the growing youth population, high unemployment, and increasing crime rates present significant challenges that could hinder progress and sustainability of solutions. The Highveld Priority Area (HPA) is an hotspot for community activism and environmental NGO activity. NGOs such VEJA and CER are anti offsets and advocate against it.

To mitigate these threats, it is essential for Eskom to collaborate closely with local stakeholdersinvest in community development initiatives and create pathways for economic participation and empowerment particularly of woman and youth. By addressing these social and economic challenges head-on, Eskom can not only ensure the success of its offset programme but also contribute positively to the overall resilience and sustainability of both eMalahleni and Phola.

1. BACKGROUND

The Department of Forestry, Fisheries and the Environment (DFFE) published in 2013 the regulations regarding Listed Activities and Minimum Emission Standards (MES) in terms of section 21 of the Air Quality Act (AQA) (GN 893 of 2013). These regulations list activities that result in atmospheric emissions which may have detrimental impact on the environment. The said regulations also prescribe emission limits that these listed activities must not exceed. Listed activities must comply with prescribed limits at different timeframes i.e. existing/old plants (operational before 2010) must comply with old plant standards by 2015 and comply with new/stricter plant standards by 2020. The same regulations (GN 893 of 2013) stipulated (prior to recent amendments) that an existing plant can apply for postponement of compliance timeframes, meaning delaying the timeframe of compliance by sending an application to the National Air Quality Officer. Eskom embarked on a process to apply for postponements of the 1st April 2015 compliance timeframe for some of Eskom's MES listed activities. The National Air Quality Officer (NAQO) in concurrence with the Nkangala District Municipality licensing authority granted postponements to Eskom and stipulated conditions to be upheld for the period of postponement. A postponement of timeframes to comply with the limits set in the regulation was granted to Eskom in 2015 to allow time for Eskom to invest in technological and other measures to reduce emissions towards meeting the set limits.

One of the conditions of the granted postponements included the requirement to submit and implement an air emission offset plan to reduce particulate matter pollution in the receiving environment. The condition specifically required that Eskom identifies and implement offset projects that will reduce Particulate Matter (PM) in the ambient / receiving environment.

An environmental offset is an action(s), designed to compensate for a negative environmental impact of resource use, a discharge, or emission from an activity. In other words, environmental offsets are alternative actions (investments or initiatives) implemented to mitigate the residual negative environmental impacts of an industrial activity. In relation to air quality, the Department of Environmental Affairs (DEA) Air Quality Offsets Guideline (Notice 333 of 2016) defines air quality offsets as an intervention, or interventions, specifically implemented to counterbalance the adverse and residual environmental impact of atmospheric emissions in order to deliver a net ambient air quality benefit within, but not limited to, the affected airshed where ambient air quality

standards are being or have the potential to be exceeded and whereby opportunities and need for offsetting exist.

1.1 ESKOM'S AIR QUALITY OFFSETS

Eskom is pursuing a multi-pronged approach to improving ambient air quality, including reducing emissions at the existing coal-fired fleet, investing in power generation from renewables and nuclear, and implementing air quality offsets. Eskom is implementing air quality offsets projects in various communities around Eskom's coal-fired power stations in the district viz. Hendrina, Arnot, Komati, Kriel, Matla, Kendal, and Duvha Power Stations as shown in Table 1 below:

Table 1: Location of Eskom's Offset Projects

Power station	Areas for offsets	Type of offset
Hendrina	**KwaZamokuhle**	Household (Phase 1)
	Neighbouring farms	Household (Phase 3)
Arnot	**Silobela**	Household (Phase 2)
	Neighbouring farms	Household (Phase 3)
Komati	**Big House informal settlement**	Household (Phase 3)
	Emahlathini informal settlement	Household (Phase 3)
	Goedehoop informal settlement	Household (Phase 3)
	Kamfefe (Driffontein)	Household (Phase 3)
	Vandykdrif	Household (Phase 3)
	Rethabile	Household (Phase 3)
	Neighbouring farms	Household (Phase 3)
Kriel	**Thubelihle**	Household (Phase 2)
	Rietspruit	Household (Phase 3)
	Neighbouring farms	Household (Phase 3)
Matla	**Emzinoni and extensions,**	Household (Phase 2)
	Chris Hani, Milan Park	Household (Phase 3)

	Extensions, Kananna Ext 6, **Thambo (4300 households only)** **Neighbouring farms**	
Kendal	**Phola** **Eskom Triangle** **Khayalethu community** **Olympic community** **Makhosi community** **Arbor** **Neighbouring farms**	Household (Phase 2) Household (Phase 3) Household (Phase 3) Household (Phase 3) Household (Phase 3) Household (Phase 3) Household (Phase 3)
Duvha	**Masakhane** **Neighbouring farms**	Household (Phase 2) Household (Phase 3)

Eskom's air quality offsets are designed to reduce a community's exposure to harmful levels of air pollution by reducing emissions from local sources such as domestic coal burning and waste burning. Examples of air quality offsets implemented by Eskom are:

- switching households from coal to cleaner energy sources,
- improving thermal comfort of houses in order to minimise the need for coal-based heating in winter, and
- improving waste collection and recycling.

Such interventions have the potential to counterbalance the effect of emissions from power stations on the air quality in localities near Eskom's power stations.

2. SCOPE OF WORK

As part of phase 2 of the Eskom's AQO programme, Phola is proposed to be the main focus of Kendal Power Station's Air Quality Offset Intervention. Phola has an estimated population of 31, 885 (based on 2011 census). The estimated number of households earmarked to receive AQO intervention is 6700.

Phola meets the site selection criteria for AQO programme i.e. power station impacts on the area, the area is in non-compliance with the National Ambient Air Quality Standards (NAAQS) and there exists an opportunity for offsets. A reference ambient air quality monitoring station has been in operation in Phola for several years and the results indicate exceedances of the NAAQS for PM_{10}.

Eskom appointed Air Resource Management (Pty) Ltd (herein referred to as ARM) to support the Planning, Monitoring and Verification (PMV) services in support of the Phase 2 AQO implementation at Phola. In order to achieve this, Eskom has included eight targeted work package Activities (Table 2) for the Phola community.

Table 2: Eskom Phola PMV Activity Schedule

Activity no.	Description	Year 1	Year 2	Year 3	Year 4
1.	**Ethical clearance**	Initial report	Update report	Update report	Update report
2.	**Area intelligence**	Inception	Year 2 report (Less in-situ assessment & fuel survey)	Year 3 report (Less in-situ assessment & fuel survey)	Year 4 report
3.	**Household survey (baseline)**	Initial report			Year 4 report
4.	**Ambient Air Quality Monitoring**	Initial report	Year 2 report	Year 3 report	Year 4 report
5.	**Emission inventory**	Initial report	Year 2 report	Year 3 report	Year 4 report
6.	**Air quality modelling**	Initial report	Year 2 report	Year 3 report	Year 4 report

7.	**Project effectiveness review**	Initial report	Year 2 report	Year 3 report	Year 4 report
8.	**Database and Reporting**	Initial report	Year 2 report	Year 3 report	Year 4 report

This report is an output of Activity 2: *Area Intelligence* for Phola. The purpose of this area intelligence report is to provide a better understanding of the study area, including environmental and socioeconomic aspects that presents threats and opportunities to the successful implementation of offsets. Area intelligence gathering is a continuous process and an area intelligence (AI) report is produced annually for the duration of the PMV Phola AQO Project (4 years).

3. METHODOLOGY

In accordance with the scope of work and the schedule above, Activity 2: “Area Intelligence Report” requires collation & evaluation of intelligence information for Phola. This includes gathering relevant high level regional, social and geographical information from current and past studies conducted in Phola and local development plans. High-level regional and local geographic and social information was obtained from various government plans, and local media reports. This information was analysed and synthesised into this report. The process followed in gathering area intelligence is depicted in Figure 2. The subsequent sections (3.1 to 3.6) provide the details herein.

3.1 Document Collection	3.2 Review and Synthesis	3.3 Threats and Opportunities	3.4 Recommendations	3.5 Continuous Monitoring
Collation of relevant documentation	Review and Synthesis of documents to identify salient features in relation to offsets	Identification of threats and opportunities to the offset project.	Make recommendations to minimise threats and maximise opportunities.	Identify aspects to be monitored on a continuous basis throughout the project.

Figure 2: Area Intelligence Assessment Process Flow

The approach advances intelligence gathered from regional and local geographic, social, environmental and government planning documentation. The objective of the study is to provide Eskom with sufficient information to inform the approach they should follow to offsets in Phola and to highlight areas of risk and opportunities for the successful implementation of such offset projects.

3.1 DOCUMENT COLLECTION & COLLATION

ARM performed online searches as part of the intelligence gathering. This included information on government plans, social and economic statistics, previous studies and media reports, among others. Table 3 below shows the type of documents that were used in the compilation of the AI reports. It is important to note upfront, that very limited information on Phola itself could be found. ARM had to rely on information from eMalahleni Local Municipality and Nkangala District Municipality to infer information about Phola.

Table 3: Documents collected for the purpose of AI gathering

Document name or type	Publication year
Nkangala District Municipality's (NDM) Final Reviewed Integrated Development Plan (2024-2025) (NDM, 2024).	2024
Nkangala District Municipality's (NDM) 2024/2025 Service Delivery and Budget Implementation Plan (SDBIP) (NDM, 2024).	2024
eMalahleni Local Municipality's (ELM) Integrated Development Plan (IDP)2024-2025 (ELM, 2024)	2024
eMalahleni Local Municipality's (ELM) Municipal Spatial Development Framework, Draft Final Report: Phase 1 To Phase 5	2023
Public participation meeting reports	Various
Media reports and articles	Various
Previous studies related to air quality and offsets	Various
Eskom published and unpublished reports	2023
Local and National legislation	Various
Other Company Reports	Various

All the above documents collected were reviewed and synthesised in order to derive their relevance to offsets implementation. The review considered the following:

- Document objective
- Salient features as they relate to the offset project
- In case of policy and planning documents, key activities planned in Phola and surrounds, as they relate to offsets.

The following sections provide details on how the information contained in the documents listed above was used for the purpose of intelligence gathering. Only information that is relevant for offsets implementation was considered,

3.2 NKANGALA DISTRICT MUNICIPALITY'S (NDM) FINAL REVIEWED INTEGRATED DEVELOPMENT PLAN

According to Section 35 of the Municipal Systems Act, No 32 of 2000 an Integrated Development Plan (IDP) is a "principal strategic planning instrument which guides and informs all planning and development, and all decisions with regard to planning, management and development, in the municipality".

The NDM final IDP (NDM IDP, 2024/25) is a document that outlines the objectives and strategies to guide the allocation and management of resources within the municipality's jurisdictional area. The objective of the IDP is to improve coordination and integration of planning, budgeting and development within the Municipal area. As a five (5) year budgeting, decision-making, strategic planning and development tool, the IDP is used by the Municipality to fulfil its role of 'developmental local governance'. Table 4 summarises salient contents of the IDP that can potentially impact the roll out, implementation, execution or success of air quality offset interventions.

Table 4: NDM IDP information relevant for offset implementation

Section	Relevant section of the IDP	Relevance
Chapter 1	Provides the Background and introduction and legislative and policy framework guiding socioeconomic development in South Africa, with a particular focus on the local government sphere. Provisions of policy instruments such as the Medium-Term Expenditure Framework, National Spatial Development Perspective, National Growth Path, State of the Nation Address, the 12 National Outcomes, Provincial Growth and Development Strategy of Mpumalanga Province and the Vision 2030 constituent of socio-economic targets linked to the Sustainable Development goals are outlined.	
1.15	Community and Stakeholder Analysis	Shows the community outreach meetings held by NDM and some of the pertinent issues raised by the communities e.g. RDP houses, clinic facilities, education, local economic development were some of the themes raised by NDM communities. These can provide

Section	Relevant section of the IDP	Relevance
		insight on issues that may favour or challenge offsets projects in these areas.
1.16	SWOT analysis for NDM.	This was important for identifying opportunities and threats to offsets project implementation projects in the district.
Chapter 2	Deals with vision and mission of the District, principles and values as well as the key focus areas of council.	
2.1	Institutional Priority Issues and Developmental Needs	Articulates the Vision, Mission, Values and Strategic goals e.g. Basic Services and Infrastructure Development, Spatial Transformation and Sustainable Human settlements are listed as key Municipal priorities. It is important to ensure alignment of these priorities and their resulting initiatives with the offset projects.
Chapter 3	Provides a relatively comprehensive outline of key indicators as far as socioeconomic development status of the District in the areas of, *inter alia,* demography, unemployment, literacy levels, economic activity and income distribution. It is evident that eMalahleni and Steve Tshwete are the key drivers of the economy of the District.	
3.1	Socio-economic overview	This chapter provides an overview of NDM's demographics, the needs of its population as well as anticipated changes or trends in these areas in the long term. This is an important consideration for the offset projects.
Chapter 4	Deals with developmental issues. Key issues highlighted include the need for programmes aimed at income augmentation, development of rural infrastructure, tourism development, land reform and security of tenure, food security, sustainable livelihoods, education, health, safety and security, development of small enterprises and cooperatives as critical elements of development.	
4.6	KPA 5: Service Delivery and Infrastructure Development	This chapter provides key information on health, disease, water and sanitation etc. NDMs strategic goals are:

Section	Relevant section of the IDP	Relevance
		1)Improving Education, Training and Innovation 2) Promoting Health Care for All 4) Providing Social Protection (Welfare) to the Vulnerable 5) Building Safer, Caring Communities
4.9	KPA 6: Spatial Development Analysis and Rational	The NDM recognised high demand for integrated human settlements, lack of strategically located land for human settlements, Local Municipalities cannot to purchase prime private land for human settlements, rapid urbanisation and mushrooming of informal settlements as key challenges. It is important to review some of the strategic interventions proposed by NDM that may have an impact on the offset programme such as land reform and spatial planning.
Chapter 5	Outlines the IDP priority issues. These priorities must be contextualised against the Eskom's offset programme to ensure alignment.	
Chapter 6	Deals with the NDM's Development Objectives Strategies and Key Performance Indicators and Projects to be implemented in the immediate future. Nkangala District Municipality developed a number of Sectoral Strategic and Operational Plans together with policies as joint ventures with all Local Municipalities within the District e.g. Spatial Restructuring and Service Delivery. It is important to keep abreast with the policies that have been adopted to ensure that the Offset Programme complies with all new requirements.	
Chapter 9	Sector departments projects	Important for identifying EPWP programmes that may be complementary or antagonistic to offsets projects.

3.3 eMALAHLENI LOCAL MUNICIPALITY IDP

The eMalahleni IDP (ELM IDP, 2024/25) is an overarching strategic tool that guides and informs the planning and development, and decisions taken regarding planning, management and development within the Municipality. It is the primary strategic plan that documents the critical development needs of the municipal area (external) and the organisation (internal). Table 5 outlines the salient contents of the IDP which can potentially impact the roll out, implementation, execution or success of air quality offset interventions.

Table 5: eMalahleni IDP information relevant for offset implementation

Section	Relevant section of the IDP	Relevance
Chapter 2	Situational analysis	Important for identifying demographics and key challenges in the municipality
2.3 -2.5	Demographic trends, socio-economic trends, development indicators and household profile and services.	Important for initial assessment of Quality of Life (QoL) aspects, health situation, living conditions, and other socioeconomic indicators that affects offsets implementation and sustainability.
2.6	Informal Housing	The municipality has adopted Informal Settlement Upgrading Policy, which guides the processes of upgrading informal settlement. It will be critical to assess the content of this policy against the offset project.
2.11	Mixed SWOT and PESTLE analysis	Provides an overview of the challenges, opportunities and threats faced by ELM which is key to guide the offset implementation programme.
Chapter 3	eMalahleni Development Strategy	This Chapter provides details on ELM's Vision, Mission, Values and Strategic goals. One of ELM's top priorities is Spatial transformation and social cohesion.
Chapter 4	Public Participation and Good Governance	This chapter provides information on community engagements and key issues raised by

Section	Relevant section of the IDP	Relevance
		communities. It is essential to recognise such concerns in the design and implementation of Eskom's offset projects.
Chapter 5	Service Delivery and Infrastructure Development	Chapter 5.4.4 states the Air pollution within ELM is caused by emission of gaseous substances, liquid vapour and solid particulate matter into the atmosphere as a result of human activity which include coal fired power stations, industries, mining activities (which include smouldering mine dumps), domestic fuel burning and motor vehicles. The municipality has an air quality management plan which is currently under implementation and has developed the Air Quality Management By-Laws (AQMB) and the noise control by-laws to regulate air and noise pollution related activities within its jurisdiction.
Chapter 9	Spatial Planning	**Chapter 9.6.9** provides details on ELM's plans for Phola. ELM proposes that the land adjacent to route R545 from the N12 freeway to Phola be earmarked for commercial, industrial and mixed-use development to capitalize on visual exposure to, and physical access from the regional road network. There is also potential to strengthen the two localized activity nodes in Phola, situated along the main collector road in Phola Proper and Phola Ext 1 respectively. This plan must be noted for any potential impact on the offset programme.
Chapter 10	Intergovernmental Projects both Public and Private Sector	Provides a list of all projects in the area. The offset programme must give regard to any competing and complimentary initiatives that could have an impact on the outcome of the offset project.
Chapter 12	Organisational Score Card	Provides detailed KPAs and KPIs that ELM has embarked on.

3.4 eMALAHLENI LOCAL MUNICIPALITY SDF

ELM Spatial Development Framework (SDF) aims to provide the required spatial planning guidelines and focus areas to support the drive towards the creation of equitable and sustainable development opportunities within the district. The goal of the SDF is to present a thorough analysis and needs assessment in the area to identify development projects, infrastructure requirements, appropriate land use proposals and compile a detailed implementation and phasing programme with related budgets that is credible and meets the required standards set by the legislation e.g. SPLUMA. Table 6 summarises the salient contents of the SDF which can potentially impact the roll out, implementation, execution, or success of air quality offset interventions.

Table 6: Local Municipality SDF information relevant for the offset implementation project

Section	Information to be reviewed	Relevance
Chapter 2	Legislative and Policy Context	Provides National and local policy framework that the SDF must comply with. Chapter 2.6 presents ELS's spatial vision and objectives.
Chapter 3	Spatial Analysis and Challenges	Chapter 3 provides detail on land ownership, demographics, socio-economic profiles, land use and developmental opportunities and constraints.
Chapter 4	Spatial proposals	Provides spatial strategies and spatial plan proposal for Phola and other areas.
Chapter 5	Implementation Programme	Sets out the implementation and monitoring plans for the Spatial Development Programmes for ELM.

3.5 CENSUS DATA

ARM collected population statistics data from recently published census documents including:

- national census (2011)
- subplace (Phola Sub Place 868017001) from census (2011) by Adrian Frith.
- National census (2022)

From these datasets, the team was able to gather information such as population demographics, age distribution, income levels, and service delivery statistics.

3.6 Review of Public Participation Reports

ARM has reviewed various reports that document public participation activities by Eskom and others as well as the ELM IDP. These reports provided information on the pertinent issues raised by the community which included:

- challenges faced by the community
- key priorities for the community and
- issue/s that some community members may raise during the implementation of offsets with a view to mitigate and manage these.

3.7 Review of Media Reports & Articles

Media reports were reviewed to provide a better understanding of community dynamics. The aim was to identify local issues that can potentially impact the roll out, implementation, execution, or success of air quality offset interventions. For this, the following search words in the google search were used:

- Eskom
- Highveld pollution
- Phola
- Air quality Offsets
- Health impact of air quality
- CER
- Groundworks

3.8 Review of Previous Studies on Air Quality Offsets

There is limited online hits for previous research studies undertaken in Phola. ARM had to extend its search beyond Phola and to the broader Highveld Priority Area. The historical studies are presented in Table 7 below.

Table 7: Historical studies reviewed

Author/Forum	Title
Mchunu & Nkambule, (2019)	An evaluation of access to adequate housing: A case study of Ezamokuhle township, Mpumalanga; South Africa.
Nkambule, 2016	A critical analysis of housing Provision, livelihood activities and Social reproduction in urban Communities in South Africa: The case of Ezamokuhle, Mpumalanga.
Ugo Nnachi, 2021	Analysing the communication strategy of local municipality for information dissemination on air quality improvement
Eskom (2017,2018)	Eskom Ezamokuhle offset pilot project documents including the report on the health impacts by MRC.
Bondamakora et al (2019)	Air Quality Offsets in South Africa's Low-Income Settlements
Langerman (2019)	Options for residential emission management in South Africa; 2019 DEA NACA Workshop on Emission Reduction Options for South Africa.
NACA Offsets Workshop (2020)	A technical workshop on Air Quality Offsets was hosted at the 2020 NACA Annual Conference. Speakers and organizations at this session included: • Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs – Air Quality Management • Eskom • Sasol • North West University • University of Johannesburg • Community organizations
Shamu et al (2021)	A baseline air quality modelling assessment for a South African township: A case study of the Ezamokuhle township, Mpumalanga; South Africa
Ramandh et al (2021)	A novel application of using Unmanned Aerial Vehicles (UAVs) for air quality management
Gode et al (2021)	Diffusive Sampling of Trace Gases for A South African Township: Ezamokuhle, Mpumalanga
Ramandh et al (2022)	A Winter Status Quo Air Quality Assessment in A South African Township: Ezamokuhle, Mpumalanga

3.9 ENGAGEMENTS WITH LOCALS

ARM did not engage with local communities for this phase as Eskom is currently busy engaging & sensitising the leadership (Executive Mayor, Councillors and Community Leaders) on the Eskom Phola AQO Project. Its only after this process, can engagement occur with the local communities. It's noted that the Year 2 revision of this report will include this narrative. However, herein we summarise, below the key themes raised by communities through community participation meetings in the ELM IDP as proxy:

1. Electricity
2. Roads and Storm-water
3. Water
4. Human Settlements
5. Recreation and Sport Facilities
6. Crime Prevention
7. Town Planning and Land
8. Waste and Environment Management
9. Sanitation

4. FINDINGS

4.1 GEOGRAPHIC PROFILE

The Nkangala District Municipality (Figure 3) is a Category C municipality in the Mpumalanga Province. It is the smallest district of the three in the province, making up 22% of its geographical area. It is comprised of six local municipalities: Victor Khanye, Steve Tshwete, Emakhazeni, Thembisile Hani, eMalahleni and Dr JS Moroka. The district's headquarters are in Middelburg. Nkangala is at the economic hub of Mpumalanga and is rich in minerals and natural resources. The major cities and towns include Delmas, Dullstroom, Emgwenya (Waterval Boven), Hendrina, Kriel, KwaMhlanga, Mdala Nature Reserve, Middelburg, Ogies, **Phola**, Pullens Hope, Rietkuil, eMakhazeni, , eNtokozweni (Machadodorp)

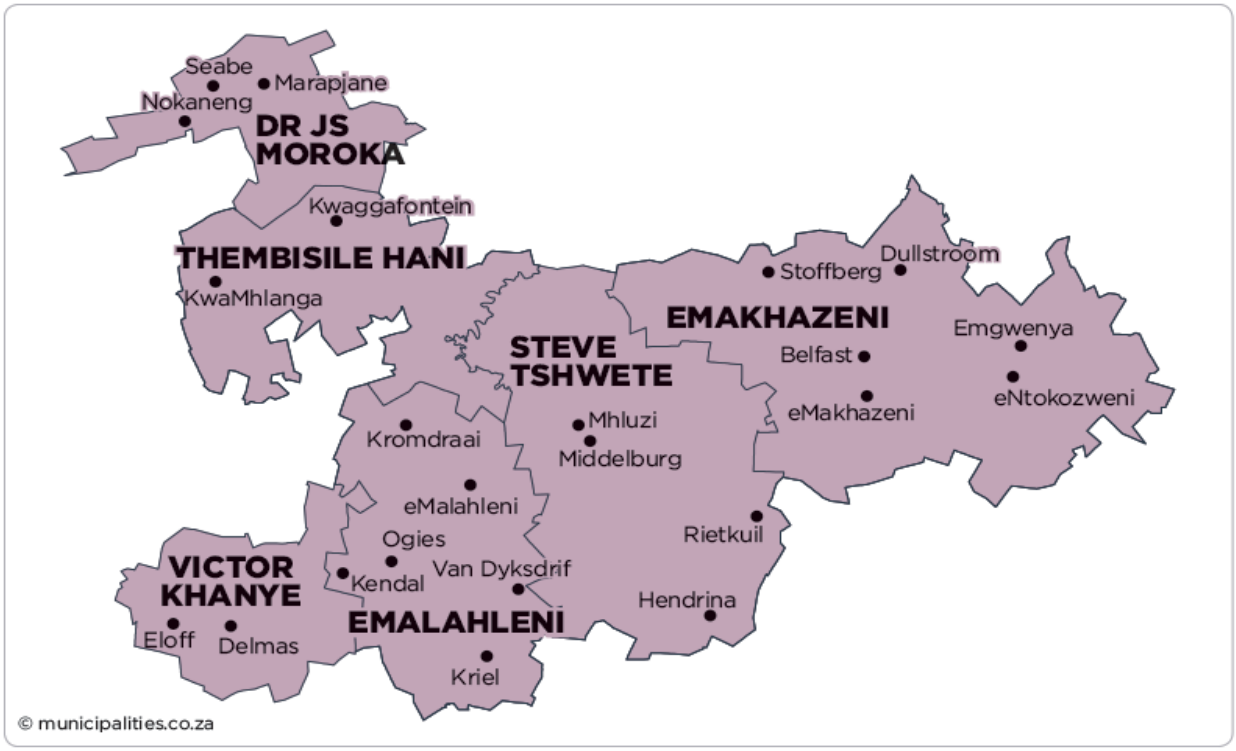


Figure 3: Map of Nkangala District Municipality

4.1.1 eMalahleni Local Municipality (ELM)

The eMalahleni Local Municipality is a Category B municipality situated in the Mpumalanga Province within the Nkangala District. It forms part of the western regions of the province and borders onto the Gauteng Province. Thembisile Hani and Victor Khanye, and City of Tshwane Metro in Gauteng, border the municipality to the north and west. The Gert Sibande District borders it to the south and Steve Tshwete is located to the east. It is one of six municipalities in the district. The major cities and towns include Kriel, Ogies and Phola.

The Municipality is strategically located in terms of the provincial context and transport network. It is situated in close proximity to the City of Ekurhuleni, City of Johannesburg and City of Tshwane Metropolitan Municipalities in Gauteng and is connected to these areas by the N4 and N12 freeways. These freeways converge at (previously Witbank), from where the N4 extends to Mbombela (previously Nelspruit), the provincial capital, and ultimately Maputo in Mozambique. The N4 freeway, along with the railway line that runs adjacent to the freeway from Gauteng to Mozambique, constitute the Maputo Corridor.

The southern areas of the Municipality form part of the region referred to as the Energy Mecca of South Africa, due to its rich deposits of coal reserves and power stations. eMalahleni and Middelburg (situated in the adjacent Steve Tshwete Municipality) are the highest order settlements in the Nkangala District. These towns offer the full spectrum of business and social activities, and both towns have large industrial areas. The towns fulfil the function of service centres to the smaller towns and settlements, as well as farms in the district.

4.1.2 Phola

Phola, is a small but growing town located in the eMalahleni Local Municipality within the Mpumalanga Province of South Africa. Situated near the industrial hub of eMalahleni (formerly known as Witbank), Phola both benefits from and to some extent is cursed by the region's significant coal mining industry and related economic activities. Phola lies approximately 30 kilometres north of the main town of eMalahleni and is located within the Highveld region of South Africa. It is located along route R545 about 5 kilometres to the north of Ogies, opposite to the north of the N12 freeway (the two towns are linked via route R545).

The area is part of the coal-rich belt, which is one of the country's key mining regions, with extensive coal reserves being extracted for energy production. Phola is strategically positioned to take advantage of the mining and industrial activities surrounding, a major centre for coal mining, power generation, and industrial activity.

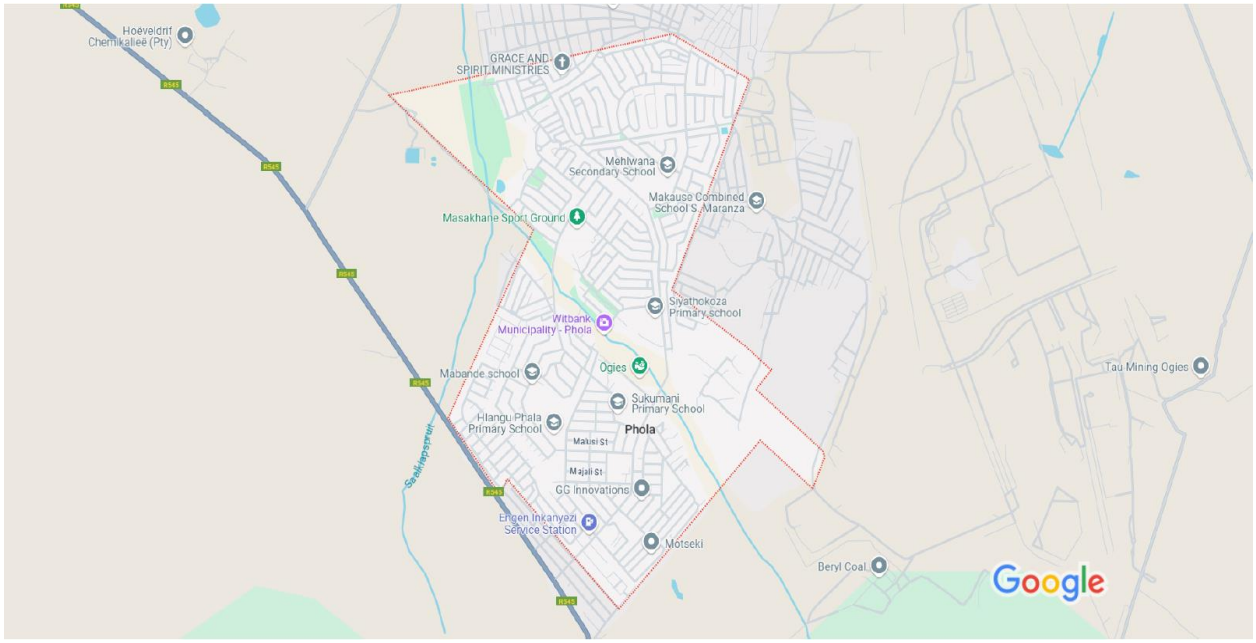


Figure 4: Phola Locality Map

4.2 POLITICAL PROFILE

4.2.2 Mpumalanga Province Overview

The ruling party in Mpumalanga is the African National Congress (ANC). In the 2024 general elections, the ANC won 27 of the 51 seats at Provincial level, retaining its outright majority in the Province. Table 8 below shows the seat determinations by Political Party for the provincial legislature.

Table 8: Provincial Political Constituency

Party	Total Seats	%
ANC	27	51.15%
MK	9	16.79%
EFF	7	13.87%
DA	6	12.02%
FF+	1	1.53%
Action SA	1	0.5%

4.2.3 Nkangala District Municipality Overview

At district and local municipal level, the council is also led by the ANC. The NDM council consists of fifty-eight (58) members elected by mixed-member proportional representation.
The current political seats composition as of 2021 is shown in Table 9 below.

Table 9: 2021 Political party seats won in NDM

Total seats	
African National Congress (ANC)	32
Economic Freedom Fighters (EFF)	10
Democratic Alliance (DA)	8
Freedom Front Plus	2
African Independent People's Organisation (AIPO)	2
4SO	2
Middelburg And Hendrina Residents Front (MHRF)	1
African Voice Progressive Party (AVPP)	1
	58

4.2.4 eMalahleni Local Municipality Overview

At local municipal level, the council is also led by the ANC. The ELM council consists of sixty-eight (68) members elected by mixed-member proportional representation. The current political seats composition as from 2021 is shown in Table 10 & Figure 5 below.

Table 10: 2021 Political party seats won in NDM

Total seats	
African National Congress (ANC)	35
Economic Freedom Fighters (EFF)	14
Democratic Alliance (DA)	13
Freedom Front Plus	4
African Christian Democratic Party (ACDP)	1
African Independent People's Organisation (AIPO)	1
	68

Figure 5: Emalahleni Executive Leadership

4.2.5 Political Demarcation

The ELM covers an area of approximately 2 678 km² divided into 34 Wards with Phola (covering Living Word Church, Phola Multi-Purpose Centre, Thuthukani Primary School, Oyco, Ogies Offices, Mbalenhle Primary School, Smaaldeel, Heuvelfontein, and Kendalbeing) being ward 28 as per the municipal demarcation (see Figure 6: Administration units and wards in ELM)

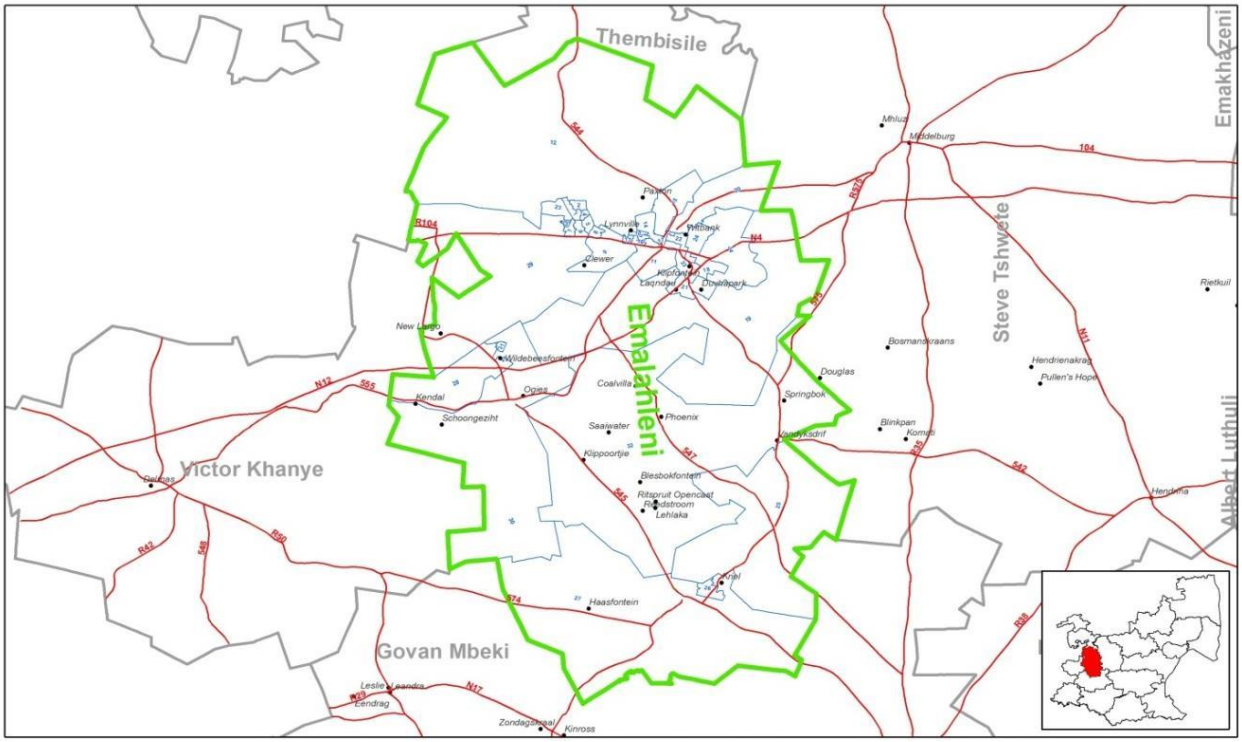


Figure 6: Administration units and wards in ELM

4.2.6 Phola Political Environment

In the 2021 Local Government Elections, the Independents received majority of the votes with 39.8 %, followed by the ANC with 24.4% and the EFF with 10% in Phola, ward 28 (Ward 83102028). This is in stark contrast to 2016 where the ANC was in the majority at 83%. It would appear that the ANC has lost ground to Independent candidates in Phola. This can be a material factor when developing a stakeholder engagement strategy for the implementation of the offset project. Multi-party councils present challenges with respect to ideologies, policies and social imperatives.

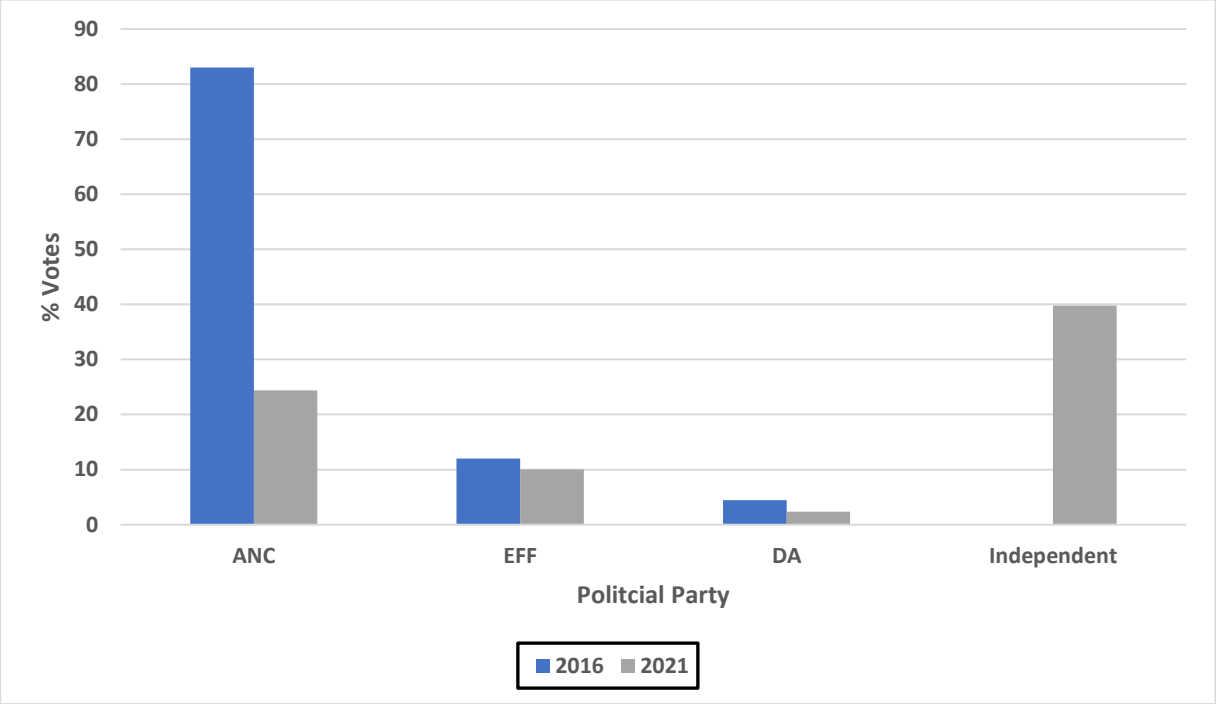


Figure 7: Phola Local Government Election Results 2016-2021 (Stats SA)

4.3 History And Profile of eMalahleni

eMalahleni Local Municipality is located within the Mpumalanga Province and is situated in the jurisdictional area of the Nkangala District Municipality. The district is located to the North-West of the province and is the smallest district in land mass (21%) and has the second largest population concentration (35%) in the province. It covers an area of about 2677.67 km² in extent. The Nkangala District Municipality is made up of six local municipalities, namely:

- Emakhazeni Local Municipality,
- Steve Tshwete Local Municipality,
- Thembisile Hani Local Municipality,
- Dr JS Moroka Local Municipality,
- eMalahleni Local Municipality, and
- Victor Khanye Local Municipality.

eMalahleni municipality formerly known as Witbank was established in 1903 and declared a town in 1910. It was renamed officially as of 3 March 2006. The city was named after the white rock

ridge situated near the current railway station. The ridge was a halting place for transport wagons and a trading post in the early years. There is a huge collection of heritage assets in ELM which is presently under threat due to rapid development.

The ELM Municipal region, which is known as “the place of coal” comprises inter alia of towns of eMalahleni, Ogies, Phola, GaNala and Kwa-Guqa. eMalahleni Local Municipality is the most industrialised region in Nkangala and its landscape features mostly opencast and underground coalmines (eMalahleni Local Municipality, 2013; 2018). The area housed various coal mining, energy generation and steel manufacturing industries. Coal mining is the largest and oldest industry in eMalahleni. About 80 per cent of the country’s coal is produced in eMalahleni and Highveld coalfield (Eberhard, 2011). Singer (2011:287) investigated the state of the environment and conceptions of environmental impact of coal mining in South Africa. The finding indicated that the most important source of coal in South Africa has been eMalahleni coal industry.

eMalahleni’s growth and fortunes is because of its abundant coal reserves. It produces the electricity that keeps South Africa’s light on due to the abundance of coal. Its mines provide South Africa with raw material for energy generation (Marais, Nel & Donaldson, 2016:63). The abundant coal mining, steel plant, power generation industries and availability of transport routes have attracted foreign investment and many companies operating in eMalahleni . Such companies are Samancor Chrome, Anglo America, Zenith, Eskom, Komatsu, Joy, BHP Billiton, Exaaro, SABMiller, Shanduka beverages Evraz , Sasol and the Renova Group (Marais, et.al, 2016). There has been significant environmental impact in the region due to the operation of coal mining, steel, and energy industries according to ELM’s IDP (Local Municipality 2013).

4.3.1 History and Profile of Phola

The town of Ogies and the township of Phola are situated in the Mpumalanga Province in South Africa. The town of Ogies was laid out in 1928 on the farm Oogiesfontein. The township of Phola was developed 5 km to the north of Ogies in 1960/1961 and was reserved for Black South Africans in keeping with Apartheid’s policies of separate group areas for each “race”. Phola today is made up of the original formal township and three informal settlements that developed alongside the

formal housing – 2 in the 1980s and the 3rd in 2004. The informal settlements of Vezi and Kanini were set up in 1984 by farm workers who lost their jobs and access to land on surrounding farms. In 2004, the Iraq informal settlement was set up by farm workers and labour tenants who lost their jobs and access to land when the mines bought up farms in the area. Today Phola-Ogies is surrounded by 12 mines and 3 coal-fired power stations. New Largo, started around 1952, was the first mine in the area. Khuthala Mine was started in 1985. The Oogjes Tweefontein Mine was opened in 1903 on the farm Klein Zuikerbosplaat and the Ogies Navigation Colliery was opened in 1936. Building started in 2008 on the Kusile Power Station.

Since 2017 the lack of service delivery has resulted in continued clashes between communities and mining companies as well as the local authorities. At times protests have turned violent with the burning of company cars and state property. This results from the extreme frustration people have with mining companies for not delivering on their promises of jobs and a better life and frustration with local authorities who fail to respond to community demands for improved delivery of services such as water and electricity (The WoMin African Gender and Extractives Alliance, 2020).

Figure 8: Phola Locality

4.4 POPULATION PROFILE

4.4.1 Population Size

4.4.1.1 eMalahleni Local Municipality

According to Statistics South Africa (Community Survey 2016), eMalahleni's population has increased from 395 466 people recorded in the Census of 2011 to 455 228 people recorded in 2016. These figures represent the third largest population in the province after the City of Mbombela and Bushbuckridge municipalities. In the Nkangala district, 31.5% of total population of Nkangala resided in eMalahleni municipal area as of 2016. The population of the municipality increased by 59762 between 2011 and 2016.

eMalahleni recorded a population growth rate of 3.2% per annum between the periods of 2011 and 2016. Due to the rate in which the population is increasing and the challenges it presents in the planning structures, the municipality in partnership with external stakeholders and industries has plans to minimise the housing backlog, creating employment opportunities and developing skills.

Given the annual growth rate of 3.2% in the area, roughly the population number, for 2024 is estimated at 585 688[1] and 2030 it is estimated that the municipality will have to deal with at least more or less 707 530 people given the historic population growth per annum (see Figure 9). This will put pressure on infrastructure development, service delivery & eventually sustainable job creation.

The increase in population might be due to mining industries and businesses around, which result in:

- Informal settlements and back rooms– estimated 10 000 people residing in these areas (Increase in informal housing).
- Water supply to informal settlements and the residents are not contributing to the cost of these services (no revenue from the expenditure).

[1] The Stats SA (2022) population number is 434 238, which is a drastic decline from 2016 and is not used.

- Strain on water, sanitation, electricity and roads resulting in quality and capacity problems (backlog on water and sanitation)

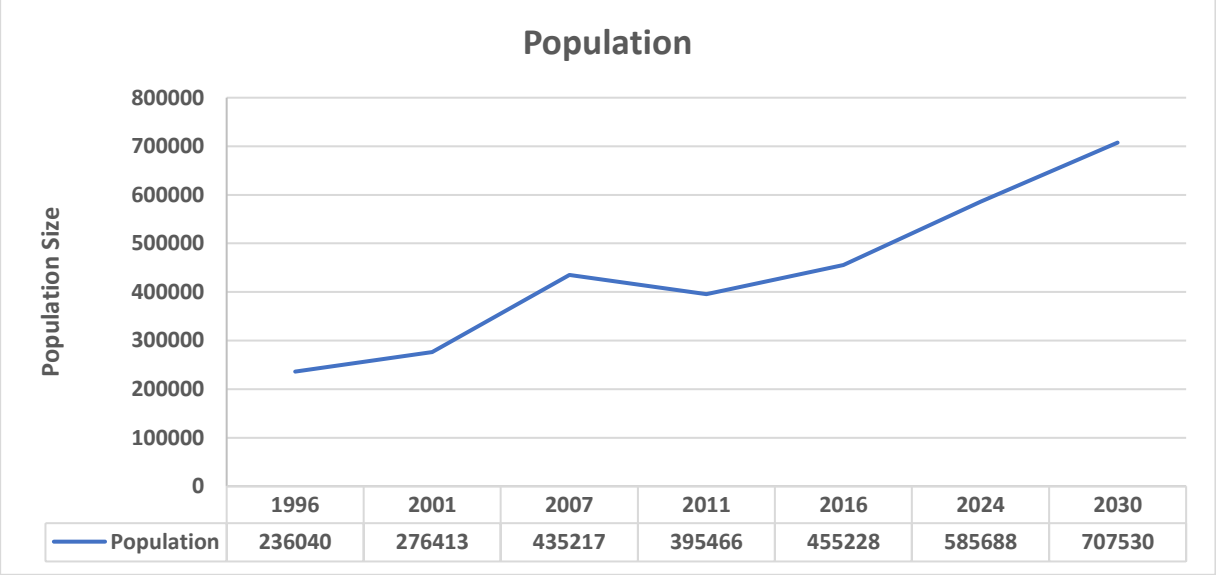


Figure 9: Population Growth in eMalahleni

4.4.1.2 Phola

According to Stats SA (2011) census data, Phola had a population size of 31 855. Phola has experienced an annual population growth rate of 3.4% between 2001 and 2011. The projected population size for Phola in 2024 would be 43 080 and 52 650 in 2030. The population density of Phola is 5,024.24/km^2 over an area of 6.346 km^2, increasing to 6794.95 / km^2 in 2024 and 8304.4/km^2 in 2030 (see Figure 10). This is significant for reasons that informal settlements and backroom dwellings are projected to grow considerably and services such as water and sanitation and electricity will probably struggle to keep up.

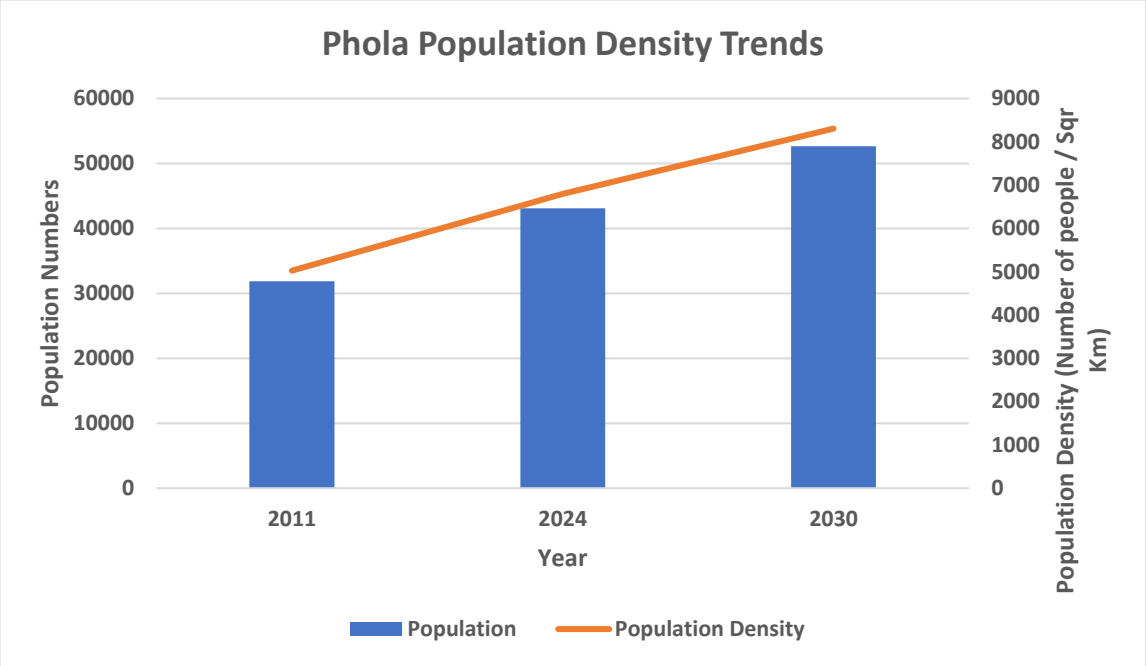


Figure 10: Population Density Trend for Phola

Table 11 below shows population size, population growth rate and population density for ELM and Phola (Stats SA).

Table 11: Population growth trends in ELM and Phola

Parameter	ELM (StatsSA, 2011)	ELM (StatsSA, 2022)	Phola (StatsSA, 2011)	Phola (StatsSA, 2022)
Population size	395 466	549 929 (434 238)**	31 885	-*
Population growth	3.2 %	0.91 %	3.4%	-*
Number of households	119 873	164 573	2 956	-*
Population density (people per square kilometre)	147.67 persons/ km²	162.15 persons/km²	5.024 persons/ km²	-*

* Data not available at subplace level

** The Stats SA (2022) population number is 434 238, which is a drastic decline from 2016 (455 228) and is not used.

4.5 AGE DISTRIBUTION

4.5.1 eMalahleni Local Municipality

The population of eMalahleni is predominantly youth (15-34 years) at 43.1% of the total population. The challenges that are posed by youthful population in the main are socio-economic. It means that the municipality should grow the economy to meet employment needs of the youth, which at present is estimated to grow at 0.9% between 2018 and 2023. This implies that the Local Economic Development (LED) Strategy of the municipality should prioritize skilling youth so that they could participate in the mainstream economy (ELM IDP, 2024/25).

The municipality should also provide social infrastructure like schools, clinics/hospitals and sporting facilities. The social infrastructure referred to will help highly reduce social ills that mainly happen when the youth are idle. The youthful population also poses spatial planning challenges, especially housing immediately and in the future. The municipality must be proactive and buy land to discourage informal settlements and land invasions. Figure 11 below shows the tornado diagram of age distribution in ELM, where the X-axis represents the percentage of population male and female and the Y-axis the age groups

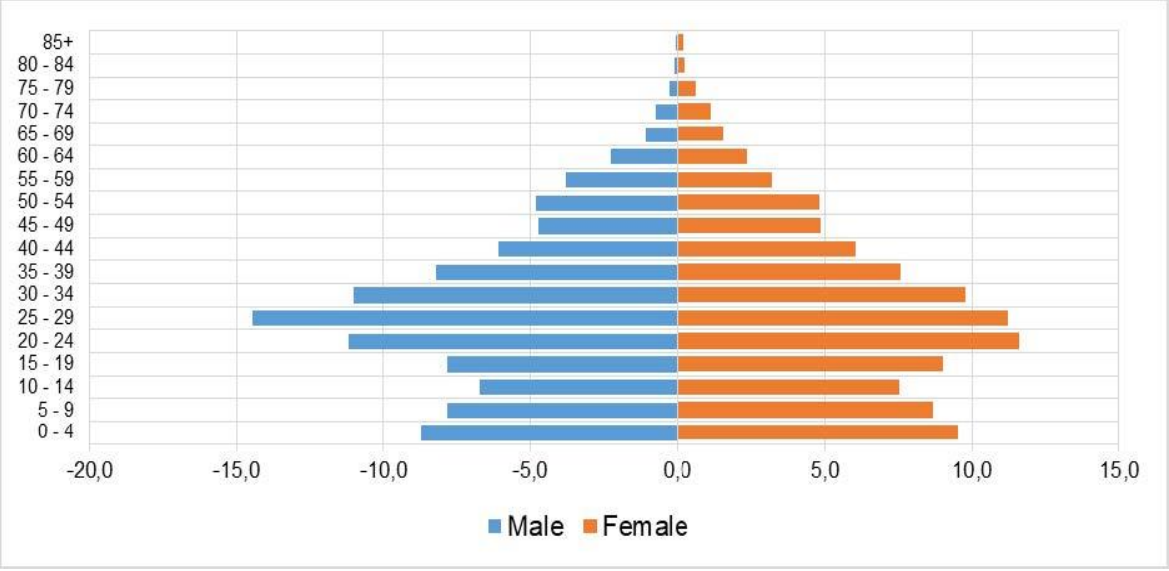


Figure 11: Population pyramid of ELM (Community Survey 2016)

The shape of the age distribution is an indication of both current and future needs regarding educational provision for younger children, health care for the whole population and vulnerable groups such as the elderly and children, employment opportunities for those in the economic age groups, and provision of social security services such as pension and assistance to those in need. The table below shows the age distribution by gender in ELM (Census 2022)

Table 12: Age Distribution by Gender (Census 2022), (ELM IDP 2024/2025)

Age	Male	Female	Total
0 – 4	20997	21389	42386
5 – 14	34001	34049	68050
15 – 34	82158	78417	160575
35 – 64	75280	69425	144705
65 +	7978	10590	18568
Total	220415	213870	434285

4.5.2 Phola

Similar to eMalahleni almost 40% of the population in Phola are youth (15-34 years). One can assume that age the distribution would be the same in 2024. The challenges with a youthful population are therefore socio-economic and issues around education, skills and jobs will be in sharp focus for this age group in Phola. This presents a unique opportunity for Eskom to adopt a differentiated strategy through youth empowerment and skills development in the roll out of the offset programmes in Phola.

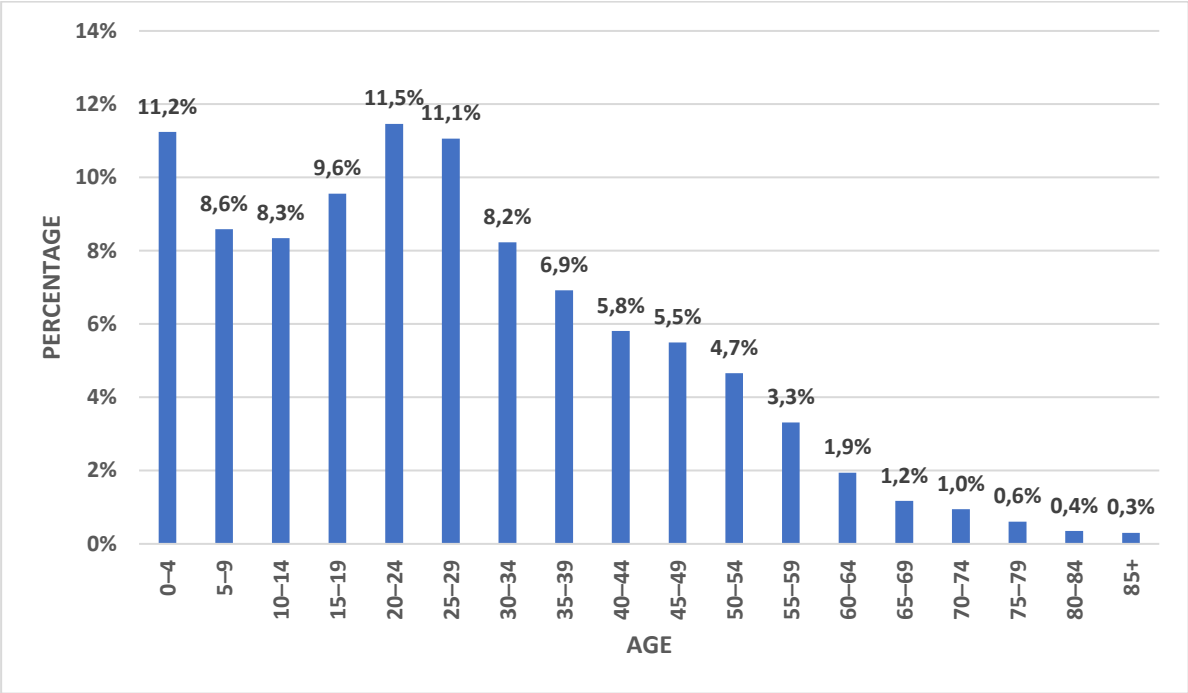


Figure 12: Population Age Distribution in Phola (Census 2011)

4.5.3 Gender

According to the Socio-Economic Review & Outlook of Mpumalanga (SERO) Report (Mpumalanga National Treasury, 2015), there is 47,1% females and 52,9% males in eMalahleni. In terms of gender distribution, the ratio of females in ELM is marginally lower than for males (Figure 13). The gender ratios are an important precursor to the type of offset initiatives that will be rolled out, for example, it is important to note that in terms of energy-related offsets women have a primary role in household energy needs as they are generally responsible for cooking.

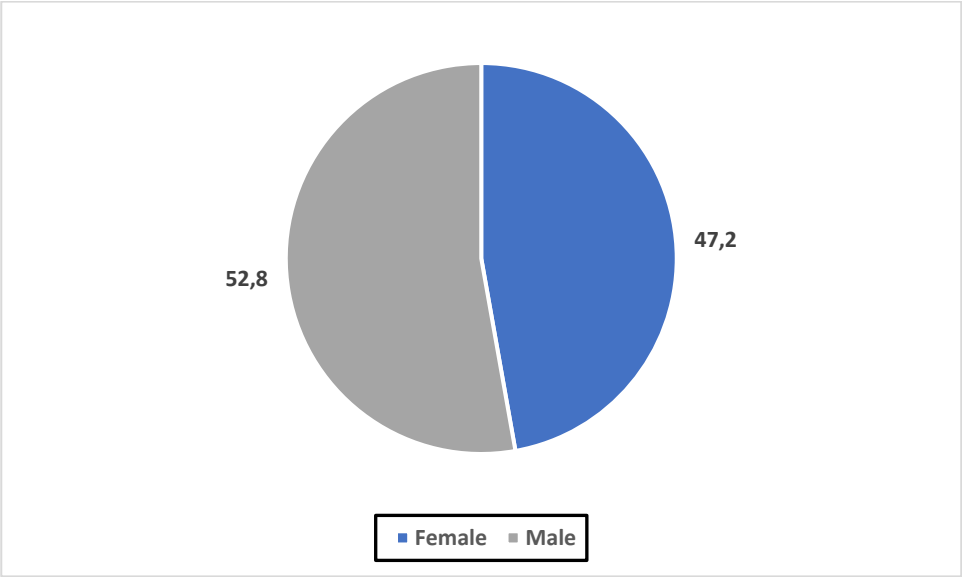


Figure 13 : Ratio of males to females in ELM (StatsSA, 2011)

The ratio of male to females in Phola depicts a more balanced gender distribution than overall in eMalahleni (Figure 14).

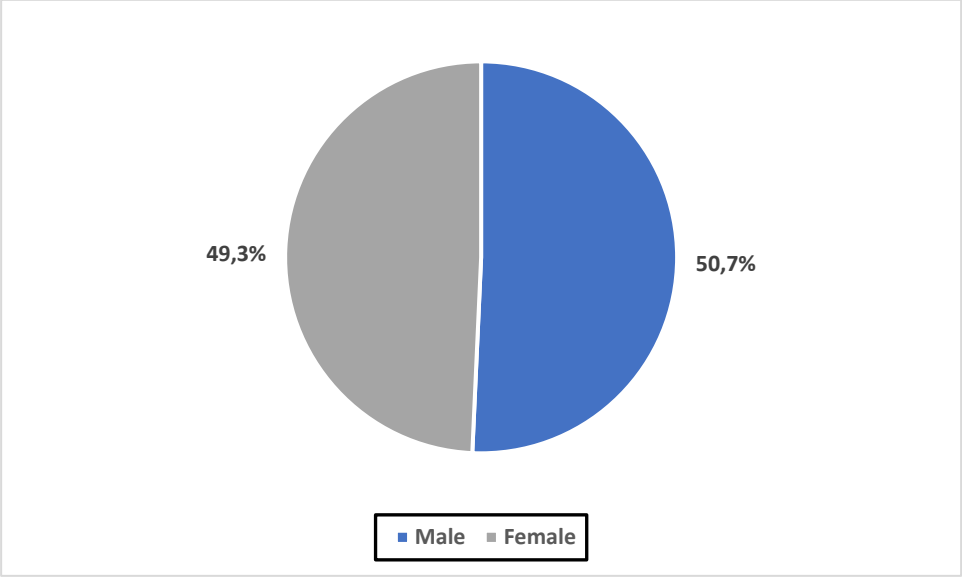


Figure 14: Ratio of males to females in Phola (StatsSA, 2011)

According to Census 2011, 27.9% of households, increasing to 29.1% in 2016 in ELM are headed by female. According to The WoMin African Gender and Extractives Alliance (“We are the victims

of pollution and victims of energy poverty", 2020), the majority of women in Phola are unemployed with many surviving on government old age pensions and child support grants. Some women run small businesses such as hair salons, shebeens and small tuckshops. They sell food to the mine workers, or chips and sweets outside school gates. Many of the women are divorced, single or widowed and were the heads of their households (The WoMin African Gender and Extractives Alliance, 2020).

Figure 15: Woman of Phola

A comparative assessment of male and female headed houses obtained from Census, 2022 is shown in the table below. Households headed by male are 57%, which is higher than females that is at 43%, representing a 15% increase from Census, 2011 data (see Table 13). This may contribute to the poverty levels of the municipality because in terms of strict unemployment rate, females are at 34.7% while males are 24.0%. This means the female headed households are suffering in terms of development as compared to male headed households. The municipality has to develop strategies that will favour the participation of women in the economy. Air Quality Offset Projects that develop woman should be a key driver for Eskom.

Table 13: A comparison of Head of Households by Local Municipality in Nkangala District (ELM IDP 2024/2025)

Municipality	Number of Male-headed households	% of Male- headed households	Number of Female-headed households	% of Female-headed households	Total
Nkangala	260 673	54	222 495	46	483 169
Victor Khanye	18 876	56	14 910	44	33 786
eMalahleni	93 886	57	70 687	43	164 573
Steve Tshwete	45 138	56	34 914	44	80 052
Emakhazeni	10 185	52	9 428	48	19 613
Thembisile Hani	57 123	52	53 440	48	110 563
Dr JS Moroka	35 465	48	39 116	52	74 581

According to the Socio-Economic Review & Outlook of Mpumalanga (SERO) Report (Mpumalanga National Treasury, 2015), Mpumalanga's male life expectancy at birth for the period 2001-2006 was 49.1 years and 53.2 years for the period 2006-2011. The projections for the period 2011-2016, according to the 2015 Mid-year Population Estimates, suggest that it will increase further to 55.8 years. Mpumalanga's female life expectancy for the periods 2001-2006 and 2006-2011 were 50.8 years and 54.9 years, respectively. The provincial figure is projected to increase to 57.2 years for the period 2011-2016, which will leave Mpumalanga with the seventh highest/third lowest female life expectancy.

The above serves as good proxy for Phola. Low life expectancy rates are generally associated with:

a) **Poor healthcare:** Inadequate access to healthcare services, including preventative care, treatment, and medications, can contribute to lower life expectancy.
b) **Environmental factors:** Exposure to environmental pollutants, such as air pollution or contaminated water, can lead to health problems and lower life expectancy.

c) **Lifestyle factors:** Unhealthy lifestyle behaviors, such as smoking, excessive alcohol consumption, poor diet, lack of exercise, and substance abuse, can contribute to a variety of health problems and reduce life expectancy.
d) **Socioeconomic factors:** Poverty, limited access to education, and social inequality can lead to poor health outcomes and lower life expectancy.
e) **Genetics:** Some genetic factors can contribute to certain health conditions that may shorten life expectancy.
f) **Infectious diseases:** Exposure to infectious diseases, including those that are preventable through vaccination or basic hygiene measures, can lead to premature death.
g) **Violence and injuries:** Accidents, violence, and injuries can be a significant cause of premature death, particularly in certain populations or geographic regions.

Eskom will need to invest time in understanding the drivers of low life expectancies in Phola to calibrate the most appropriate offset interventions that will be sustainable and effective.

The IDP for eMalahleni includes a focus on gender development. The Municipality has developed an Employment Equity Plan aimed at eliminating unfair discrimination in employment, providing for Affirmative Action to address the imbalances of the past and create equity in employment. The policy specifically ensures that women are considered in the senior positions. ELM has established a Transversal unit and a Gender desk mandated to coordinate and implement programmes that address gender discrimination.

Gender Mainstreaming is of national interest and should be adopted by all municipalities in South Africa. Given this, there may be political interest in incorporating gender mainstreaming into offsets implementation projects.

4.5.4 Population Groups

Statistics on population groups present information necessary for diversity and cultural aspects in a community. It is known to researchers and heavily impacted communities, that historically disadvantage individuals (HDI) face a higher average burden of air pollution. This manifests in

racial/ethnic disparities, caused by spatial heterogeneities. Whilst it is clearly evident, that in both overall and Phola specifically, the Black / African groups is the majority group.

4.5.5 ELM

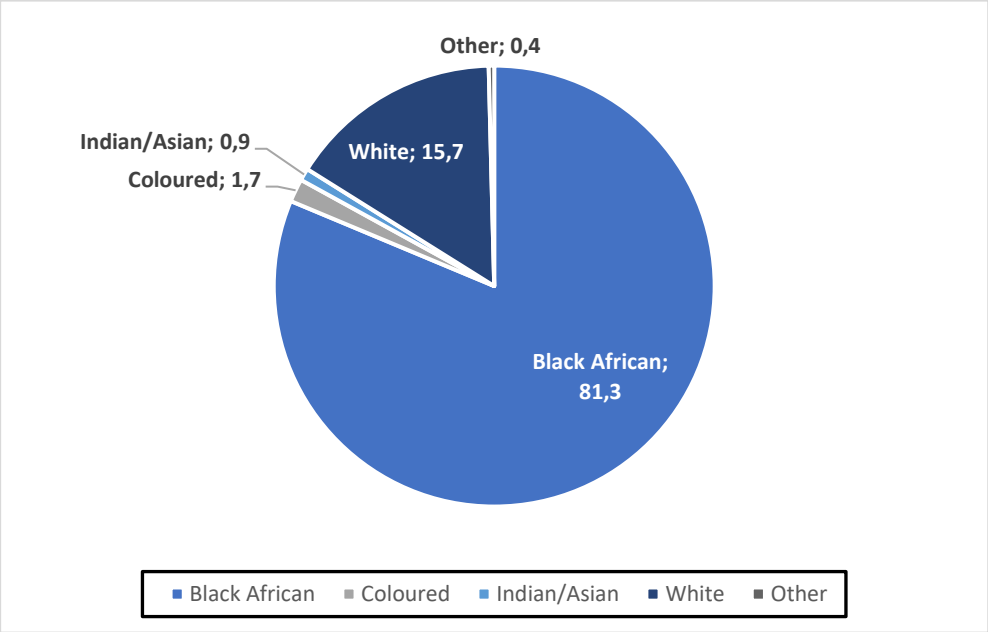


Figure 16: ELM Population Groups (Census 2011

4.5.6 Phola

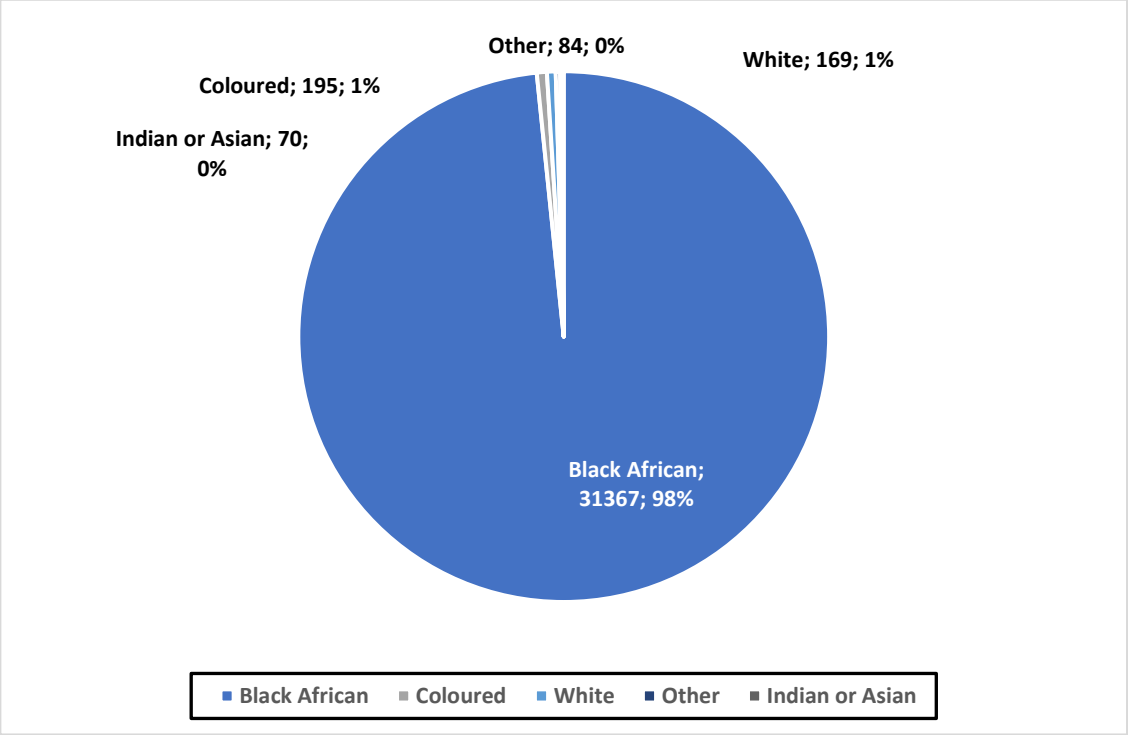


Figure 17 : Population Groups for Phola (Census 2011)

4.6 EDUCATION PROFILE

Education levels affect income for households, which subsequently affect their choice of energy carriers. The level of education is also an important indicator of possible future socioeconomic conditions on the community. When the youth is not equipping themselves with education, they are setting themselves up to perpetuate poor living conditions into their futures. Consequently, all poverty-related aspects of energy use (such as the use of cheap and dirty fuels) continue.

4.6.1 Municipality-wide Education Profiles

Table 14 below compares the education levels between the 2011 Census and 2022 Census data points for ELM. It is disturbing to observe that there has not been a remarkable improvement in 11 years of people 20 years or older with no education and there's actually been a decline in people 20 years or older with tertiary education in the same time. It is a travesty of our democracy

to observe such trends. The offset programme will thus need to ensure that youth and woman are the biggest beneficiaries of these initiatives.

Table 14: Educational achievements in eMalahleni, (Stats SA, 2011-2022 and ELM IDP, 2024/2025)

Year	2011	2022
Share of population 20 years & older with no education	5.8 %	5.1%
Share of population 20 & older with tertiary education	12.5 %	9.7 %
Share of Population (5-24 years) attending educational institution	68.9%	70.9%
Share of Population (5-24 years) not attending educational institution	31.1 %	29.1%

According to Stats SA, only 10% of ELM population (Figure 18) have completed secondary education (which means having matric qualification) compared to 12% at National level (Figure 19). Also of concern is the almost 6% of the age group 20 years plus have no formal education and 29.1% of youth aged 15-24 do not attend any form of educational institution (Stats SA, 2022).

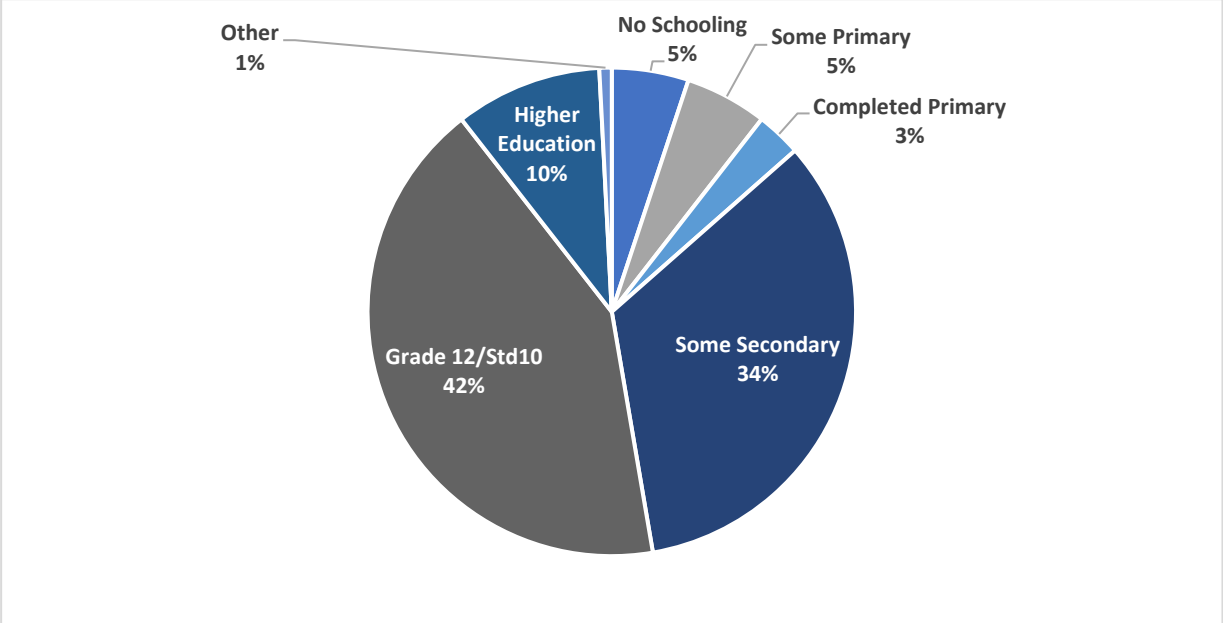


Figure 18: ELM highest level of education (StatsSA, 2022)

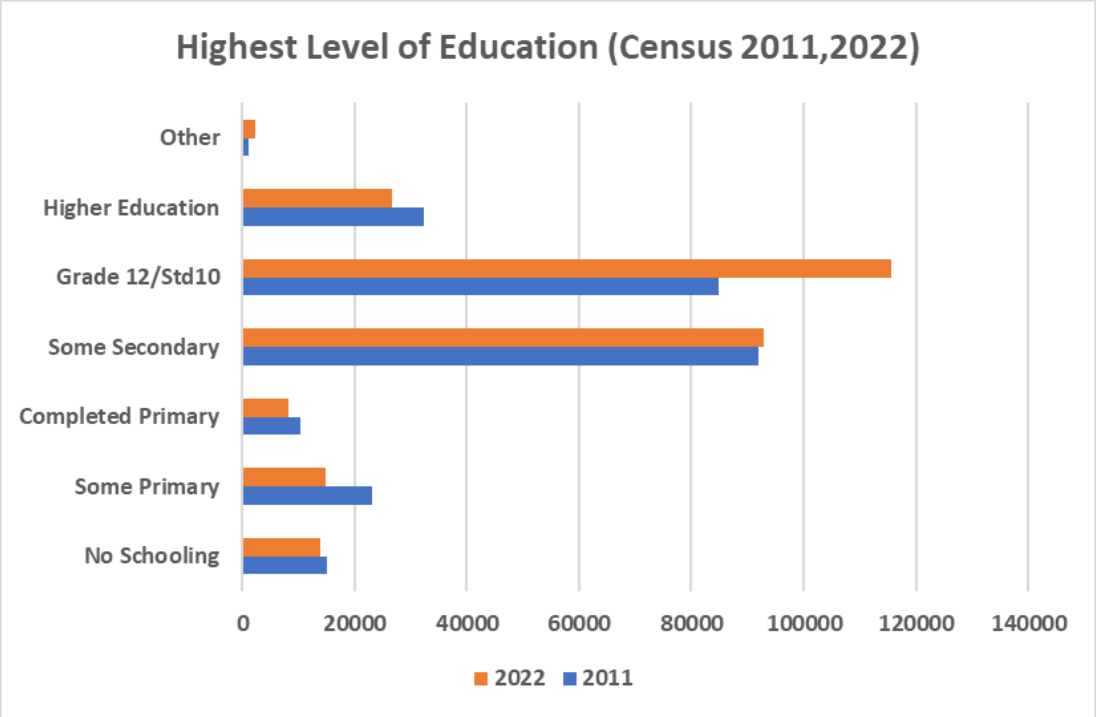


Figure 19: Education Profile in ELM (Stats SA, 2011, 2022)

Figure 20 below contrasts educational levels between ELM and National. Notably, ELM appears to outperform the rest of South Africa at most levels of education except for higher education. It's is an area of importance, given the youthful population of ELM and the emphasis that needs to be placed on education and job creation. The offset projects must be cognizant of such data sets during the design and implementation phases.

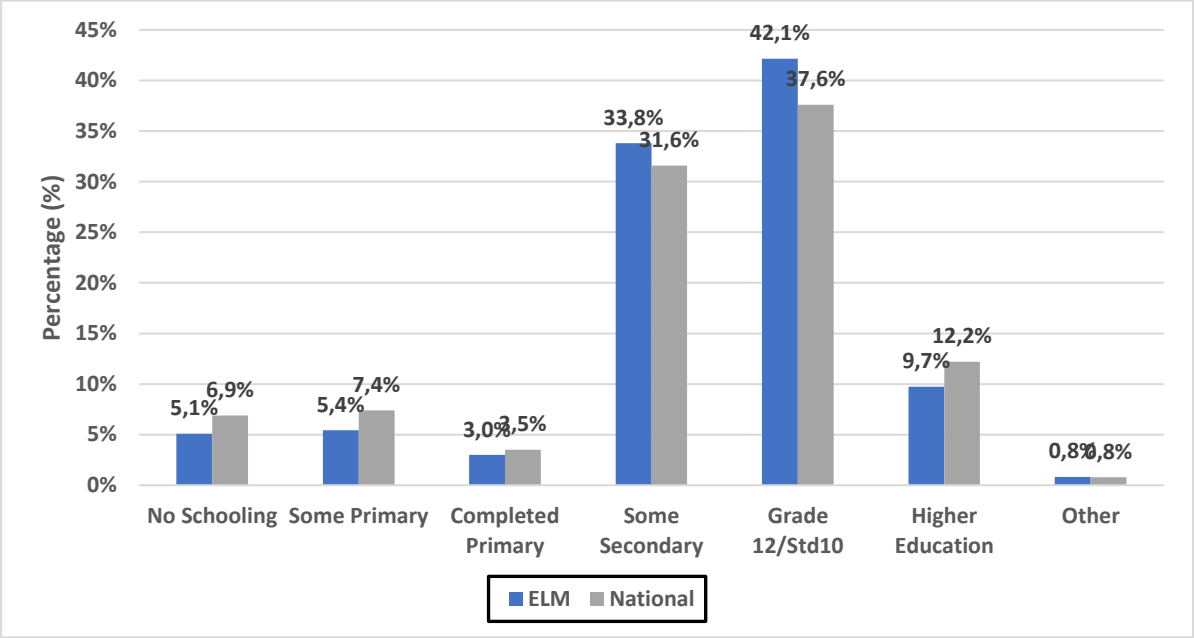


Figure 20: ELM vs National Educational Levels (Statics SA, 2022)

In terms of education generally, the municipality is faced with numerous skill challenges in the labour market and economy, which are described as follows, mismatch of skills in the labour market, shortages of skilled and oversupply of unskilled & semi-skilled workers, skills not always in line with the needs of the economy, high unemployment and very high youth unemployed, employability challenge of especially the young people, low economic and employment growth – vicious circle (ELM IDP, 2024/2025).

4.6.2 Phola education profile

Unfortunately, little to no statistics on the education profile for Phola itself is available.

4.7 EMPLOYMENT PROFILES & INDIVIDUAL INCOME

Employment profiles and income levels are indicative of the ability of households to afford their needs, including their ability to afford certain types of energy carriers/fuels. Generally, cleaner sources of energy are relatively expensive, hence low-income households often have no choice but to resort to cheaper fuels that are dirty and polluting.

4.7.1 Municipality-wide Employment Profiles

Employment status is an indicator that relates to numerous aspects important in the assessment of quality of life of communities. Table 15 shows that 190 662 people (67.7% of the population) were economically active (employed or unemployed looking for a job), and only 49.2 % are actually employed. Approximately 3.4 % are discouraged work seekers and 28.9 % are economically inactive.

The strict unemployment rate deteriorated from 25.2% in 2016 to 28.2% in 2021. The expanded unemployment rate deteriorated from 31.9% to 36.9% (2016 to 2021). In 2021, the strict unemployment rate for females was 34.7% and that of males 24.0%. Furthermore, the strict youth (15-34 years) unemployment rate was 41.0% (ELM IDP 2024/2025).

Table 15: Employment profile of ELM (Stats SA, 2011)

Employment Status	Number	Percentage
Employed	138 548	49.2 %
Unemployed (looking)	52 114	18.5 %
Discouraged Work Seeker	9 612	3.4 %
Not Economically Active	81 494	28.9 %

The ELM Local Economic Development (LED) Strategy 2018 -2023, indicates the following Labour Indicators as at 2016 for ELM:

Table 16: ELM economically active population by gender

Gender	Population	Economically Active Population (EAP)	EAP as %	Unemployment	Unemployment rate
Male	231,861	132,586	57.2%	30,038	22.7%
Female	208,123	85,253	41.0%	28,356	33.3%
Total	439,984	217,839	49.5%	58,394	26.8%

Table 16 indicates that close to 218 000 people in eMalahleni were economically active. Almost 60% of the economically active labour force consist of males while females only make up about 40% of the EA labour force. Out of the population of more than 400 000, only 50% are economically active and the other 50% of the population are dependent on the work force. The unemployment rate was at 27% in 2016. The unemployment rate of females is at 33% of the EA population and that of men is almost at 23%. This may mean that most of the job opportunities available in eMalahleni are biased towards men than women. Its known for its coal mines and most of the workforce works underground or in manufacturing.

There was a decline in employment level between 2016 & 2021 of 0.1% p.a. The average annual employment growth deteriorated significantly, compared with the 3.7% increase between 2010 & 2015. The job losses in 2020 and 2021 combined were around 30 000 due to COVID-related factors, many of them in the informal economy (ELM IDP, 2024-2025).

Youth unemployment rate according to the Census figure was 36.0%. Unemployment within females is a challenge, which needs to be planned for. The largest employing industries in eMalahleni are mining19.6%, Wholesale and trade 17.3% and community service/government services 15.3%. The investment climate of the municipality needs to improve and be conducive so that it can accommodate the new job seekers. The municipality also need to increase the levels of education and skills to improve the employability of young people. Projects of high labour absorption and intensity as well as viable and sustainable SMMEs and Cooperatives will play a significant role. The main sector of employment is mining at 59, 8% in 2015 followed by utility at 8% in 2015. In terms of youth labour i.e. between ages 15-34, the municipality has to develop

strategies and plans of curbing the unemployment challenges especially towards the female youth.

4.7.2 ELM Average Household Income

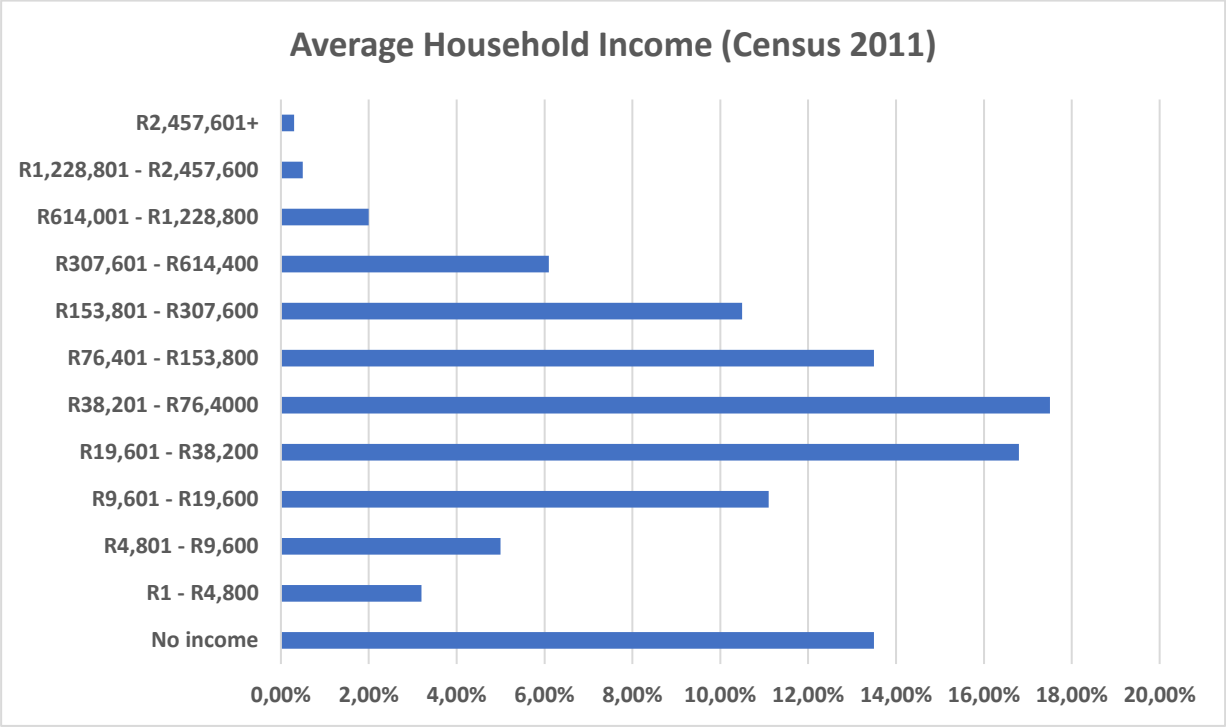


Figure 21: ELM Average Household Income (Census 2011)

In ELM, people without an income account for close to 15% of the population and majority of households earn less than R310 000 per annum (Figure 21).

The share of the population below lower-bound poverty line (LBPL) deteriorated from 32.1 % in 2019 to 32.4 % in 2022. In 2022, the number of people below LBPL was 158 267, which is a deterioration from 149 819 in 2019 (ELM IDP 2024/25).

In the calculation of Local Government equitable share, National Treasury estimates had 88 167 poor households in 2023 and is around 50% of the households. In 2022, the poorest 40% shared 7.6 % of the total income, which was equal to the 7.0% share recorded in 2021. Whilst ELM is blessed with mining and other industrial activity, this does not manifest itself in the earning

potential of its people. Research shows that household income has a direct correlation on household energy choices. Eskom's offset projects must take household income into consideration e.g., proposing moving up the energy ladder to cleaner but more expensive fuels such as LPG may not be easily adopted by the community.

4.7.3 Phola Employment Profile

ARM could not find any research or studies that provide statistics on employment for Phola.

4.7.4 ELM Social Grants

Table 17 below, indicates that the number of people who receive social grants in ELM has been increasing since 2021 except War Veterans which has remained constant at zero. Child support grant has the highest number of recipients followed by old age grant. Highest number of recipients of child support shows that there is high unemployment rate among the youth. The same can be inferred for Phola (ELM IDP 2024/25).

This is an important aspect for Eskom to consider, when planning and rolling out offset initiatives. The high number of grant recipients. particularly child support and old age is indicative of the socio-economic conditions in ELM and Phola and hence will have an impact on the sustainability of offset solutions e.g. roll out of LPG may not be easily adopted because of cost.

Table 17: ELM Social grant beneficiaries in absolute numbers, 2019—2024

Grant type	Number receiving grant (January	Number receiving 2022)	Number receiving	Number receiving 2024)
Child Support	72182	73117	75308	76 922
Old Age	18106	18517	19407	20 471
Disability	5714	5500	5659	5642
Foster Care	2503	1806	1621	1448
Care Dependency	952	894	885	943
Grant-in-Aid	819	867	972	1078
War Veteran	0	0	0	0
TOTAL	**100,276**	**100,690**	**103 852**	**106 504**

4.7.5 Gini-Coefficient

A Gini-coefficient of 0.62 was recorded in 2011 which shows slight improvement between 2001 and 2011 & slightly lower (better) than the district but equal to provincial level. The surrounding mines contribute to employment and general economy of ELM. The poverty gap was R168 million in 2011 which is an increasing trend. This disparity and wealth gap manifests in increased crime, protests and social and civil disobedience. This can have consequential negative impact on offset projects especially if community perceptions, needs and wants are not aligned with the offset project objectives. Eskom will have to ensure that it has a strong stakeholder engagement strategy to anticipate and mitigate against such risks.

4.8 KEY ECONOMIC SECTORS IN THE LOCAL MUNICIPALITY & TOWNSHIP

The nature of economic activities in an area can influence the type of fuel used by households. For example, communities living next to coal mines tend to use coal as fuel, especially during winter months because coal would be available to them at cheaper price. Similarly, communities living near large plantations are likely to use wood for heating and cooking.

In 2023, the formal employment sector in eMalahleni comprised of the following four largest employing industries viz. mining, trade (including tourism and the informal sector), community services, & finance as shown in the Table 18 below.

The municipality reviewed the Local Economic Development strategy and are pursuing the following focus areas, which will create employment opportunities viz. fly – ash, establishment of mining museum, convention centre (establishment of a Hotel and Dome), establishment of light industrial workshops and establishment of an Agri–processing hub. The Eskom offset projects should align to some of these priority projects.

Table 18: Employment by Industry (EML IDP, 2024-2025)'

Industry	Percentage contribution to 's employment, 2022
Mining	20.6 %
Trade	17.7 %
Community Services	16.6 %
Finance	11.2 %
Manufacturing	8.3 %
Construction	7.4 %
Private households	7.0 %
Transport	4.7 %
Utilities	3.8 %

4.8.1 Retail and Wholesale Trade

The Witbank CBD represents the largest single concentration of retail activity in the eMalahleni Local Municipality area. The CBD represents about 155 300 m² of retail space while the other four main shopping centres comprise about 151 000 m² of retail space in total. The Witbank CBD represents the Urban Hub of ELM.

The township of Phola (meaning desert) is located about 5 kilometres to the north of Ogies, but opposite to the N12 freeway. The two towns are linked via route R545. A watercourse divides Phola into two segments and forms a natural boundary at the north-western end of the settlement. Informal settlement occurs on the southern boundary (Moller Land), in the central parts, and along the northern end while new townships are located along the town's eastern border. The economic base of the town is very limited. Underground mining between Ogies and Phola poses constraints to the future spatial consolidation of these two towns.

Apart from this retail/business activity, most of the other towns and settlements in eMalahleni hold some smaller concentration of economic activities by way of shopping centres and General dealers and spaza shops intended to serve people locally.

4.8.2 Industrial

As far as industrial activity is concerned there are nine major industrial areas in the Municipal area, most of which are situated within or around Witbank town:

- The Ferrobank industrial area situated immediately to the northwest of the Lynnville residential area
- Klarinet industrial area (relatively undeveloped) to the north of Witbank CBD
- Old Coronation west of the CBD, which is affected by underground mining
- The Rand Carbide industrial area situated in the central northern part of eMalahleni
- X6 and X34 situated immediately south of the Witbank CBD
- X25 industrial area which forms part of the southern residential areas of Witbank town
- The Naauwpoort industrial area which is situated on the southern part of the town along R544
- The KwaMthunzi Vilakazi/Highveld Steel industrial area to the west of the Witbank town.

Underground mining poses a constraint to the extension of many of the existing heavy industrial areas in and around eMalahleni. Ga-Nala holds a small industrial/commercial area to the south of the CBD and there are initiatives to develop Ga-Nala X17 as a future industrial area.

4.8.3 Mining

The largest part of the municipal area is underlain by coal deposits. Mining is a very significant economic sector in the area, but it has also become a major form of development constraint due to shallow underground mining - especially in the central, northern and southern portions of Witbank town. This has major implications in terms of correcting the distorted spatial pattern of Witbank town itself. There is a conflict between the mining operations and settlement development, especially in terms of the hazards associated with past mining operations, such as underground fires in old mines, seepage from mines and communities mining coal from remaining coal pillars and old coal dumps. Coal mining has also out-performed agriculture in terms of land-use within the municipal area, thereby causing a major challenge on agriculture development. Figure 22 shows the extent of mining areas in ELM.

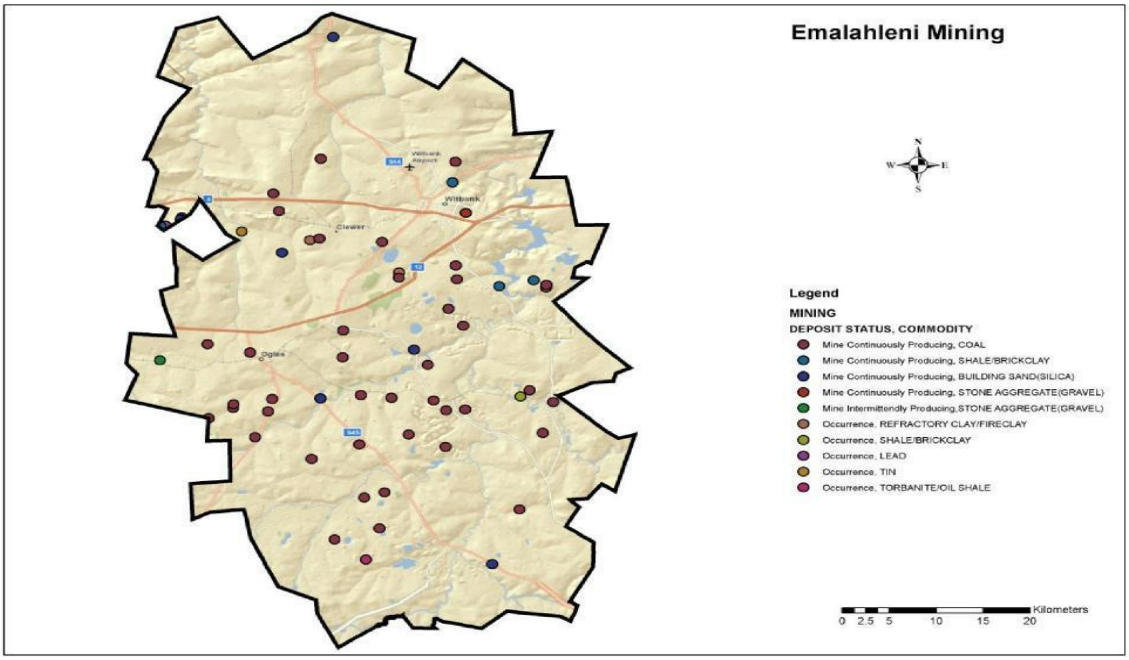


Figure 22: Mining Areas

4.8.4 Electricity

The eMalahleni Local Municipality has four power stations situated within its area of jurisdiction. The first is the Kendal Power Station which is situated immediately to the south of the N12 freeway in the vicinity of the South western boundary of Witbank. To the south, the Matla and Ga-Nala Power stations are very important economic activities for labour absorption for Ga-Nala residents. Duvha Power Station is situated a few kilometres to the east of town. The new Kusile power station is situated towards the West of the town and is at the boundary with Victor Khanye municipality.

4.8.5 Agriculture

The areas between the mining activity, the power stations and the residential areas are mostly utilised for agricultural purposes. Agricultural activities mostly comprise of crop farming (especially grains) and stock farming (cattle).

Agricultural land around the settlements in the eMalahleni area is increasingly under threat, due to the need for urban expansion, mining development and electricity generation. The constraints posed by underground mining further decreases the attractiveness of agricultural land for development. The agricultural land in eMalahleni is however considered to have high production value and potential and should be protected as a scarce resource. In this regard, the consolidation and integration of dispersed settlements (e.g. integration of Ga-Nala and Thubelihle) is proposed, as opposed to extension of the settlements into precinct agricultural areas.

4.8.6 Phola Economic Activity

In Phola, whist there is no direct reference to economic drivers, it may be assumed that the drivers of economic activity may include typical economic activities characteristic of township economy. These are highly informal activities and enterprises that are diverse and sometimes use households as sites of production. The following are examples of key economic activities in typical for townships such as Phola.

Table 19: Typical Local "township" economic activities

Economic activity	Description
Taxi industry	Some community members are owners and drivers of taxis that commute community members between home, work places and town. These taxis could be noticed in people's yards.
Home-based enterprises	• Some community members sell merchandise within their yards e.g. sale of livestock and chickens for weddings and funerals, sale of firewood and coal (mainly coal than wood). • Others undertake scrap metal recycling where they collect metals which they store in the yards before they are taken to a designated collection point. • Others own taverns and chisanyamas (braai meat vending) and tuck-shops within their yards.
Nodal enterprises	Some community members sell fruits & vegetables, clothes and small electronics at specific nodal points such as taxi ranks and in Phola.
Other	There have been reports of income being generated through illegal gambling activities and sex work in the area.

* Some of these enterprises (like chisanyamas and coal sales) are direct contributors to local air pollution

These local dynamics are important for consideration in Eskom's offsets because the implementation of offsets may require a shift in micro-economic activities in the community. For example, as offsets aim to shift households from coal to gas, the micro-economic activity may have to shift from coal sales to gas sales. The implications of these for small businesses can be significant considering that gas requires special handling and storage requirements that some merchants my not have.

4.9 SAFETY & SECURITY

There are five police stations in the eMalahleni area, namely in eMalahleni City, Phola, Kwa-Guqa, Ga-Nala and Ogies.

ELM had 268 serious crimes per 10 000 people in 2022/23 year. Examples of some of the serious crimes are murder, rape and gender-based violence. Furthermore, ELM is severely affected by theft and vandalism of municipal property which affects service delivery negatively (ELM IDP, 2024/2025).

Safety & security is important for offset projects because it limits the type of offsets that can be implemented. For example, installation of alternative energy (such as solar energy installations) as an offset intervention will be limited by the possibility that the panels and other equipment associated with such installations may be stolen. Similarly, roll out of energy efficient stoves, solar water heaters etc. may make recipients of offsets vulnerable and susceptible to crime such as housebreaking etc. Thus, it is important to understand issues of safety and security in the area before implementing offsets.

4.9.1 Crime in Phola

According to the South Africa Police Services (SAPS) second quarter crime statistics for 2024/2025, serious crime has been increasing over the period July 2020 to September 2024 in

Phola. Murder, assault, robbery and property crimes have all been on the increase. Table 20 below presents the breakdown of the type of crimes experienced in Phola[2].

Table 20: Crime Statistics for Phola, Q2 2024/2025 (SAPS, Second Quarter Crime Statistics 2024/2025)

CRIME CATEGORY	July 2020 to September 2020	July 2021 to September 2021	July 2022 to September 2022	July 2023 to September 2023	July 2024 to September 2024
CONTACT CRIMES (CRIMES AGAINST THE PERSON)					
Murder	3	5	9	3	2
Sexual offences	5	4	3	3	3
Attempted murder	3	3	5	2	3
Assault with the intent to inflict grievous bodily harm	39	37	28	34	38
Common assault	21	17	29	31	37
Common robbery	0	2	3	6	5
Robbery with aggravating circumstances	21	17	30	37	49
Contact crime (Crimes against the person)	**92**	**85**	**107**	**116**	**137**
SEXUAL OFFENCES – BREAKDOWN					
Rape	4	4	2	3	2
Sexual assault	1	0	1	0	1
Attempted sexual offences	0	0	0	0	0
Contact sexual offences	0	0	0	0	0
SOME SUBCATEGORIES OF AGGRAVATED ROBBERY					
Carjacking	8	2	7	12	17
Robbery at residential premises	0	1	2	2	2
Robbery at non-residential premises	3	2	1	1	11
TRIO Crime	***11***	***5***	***10***	***15***	***30***
Robbery of cash in transit	0	0	0	0	0
Bank robbery	0	0	0	0	0

[2] South African Police Services.2025, Second Quarter Crime Statistics. Available at https://www.saps.gov.za/services/crimestats.php [Accessed: 10 December 2024].

CRIME CATEGORY	July 2020 to September 2020	July 2021 to September 2021	July 2022 to September 2022	July 2023 to September 2023	July 2024 to September 2024
Truck hijacking	2	0	2	3	1
CONTACT-RELATED CRIMES					
Arson	1	0	1	1	0
Malicious damage to property	1	21	17	15	12
Contact-related crime	**2**	**21**	**18**	**16**	**12**
PROPERTY-RELATED CRIMES					
Burglary at non-residential premises	11	8	10	3	3
Burglary at residential premises	20	15	17	37	23
Theft of motor vehicle and motorcycle	9	5	2	4	10
Theft out of or from motor vehicle	6	2	3	13	4
Stock-theft	1	0	3	0	3
Property-related crime	**47**	**30**	**35**	**57**	**43**

Given the above, it is important that Eskom considers these crime statistics in Phola when considering the type of offset intervention it intends to deploy. This is to not only ensure the safety of recipients of offsets but also the long-term sustainability of offset solutions. Offset projects should have the desired effect of not only addressing health impact due to poor air quality but also alleviating socio-economic conditions in the areas they are implemented in. Eskom's offset projects should consider aspects of job creation, skills development and youth development in areas like Phola.

4.10 Human Settlements & Infrastructure

The type of human settlements and infrastructure has relevance for offsets in two ways. Firstly, where dirty fuels are used by the community that live mainly in informal dwellings or shacks, it will not be easy to provide offsets interventions such as ceiling retrofits and provision of alternative energy stoves (e.g. gas stoves). Secondly, infrastructure challenges such as untarred roads can result in dust emissions which contribute to deterioration of air quality, which is counter to the impacts of offsets. In the following sections, we consider the state of municipality-wide

infrastructure in eMalahleni and where information is available, we drill deeper into the state of infrastructure in Phola itself.

4.10.1 Local Municipality-wide Infrastructure Overview

According to Statistics South Africa, Census 2011 and 2022, informal dwellings decreased from 23 138 in 2011 to 18 489 in 2022 of households still living in informal dwellings, which is a decrease from 19.3 % to 11.2 %. Whilst this represents, a remarkable decrease, informal settlements are still a challenge for the municipality.

The municipality has adopted the Informal Settlement Upgrading Policy, which guides the processes of upgrading informal settlement. According to the eMalahleni Spatial Development Framework, October 2023, has 72 informal settlements. The informal settlements situation is as follows (ELM IDP 2024/25):

- Total number of upgrading plans approved by Council is 14
- Number of informal settlements currently in planning process is 24
- Number of informal settlements formalised is 13
- Total number of informal settlements to be relocated is 11
- Relocated plans finalised is 10
- Number of informal settlements without upgrading plans is 24
- Number of informal settlements on farms is 12
- Number of informal settlements with water and sanitation is 52
- Number of informal settlements with no water and sanitation is 16

Figure 23: ELM Dwelling Types (Census 2011, 2022) below shows that there is an increase in formal dwellings, which implies that people want to own their own houses. The positive development is that there is a decrease in traditional dwelling, informal dwelling and other forms of dwelling.

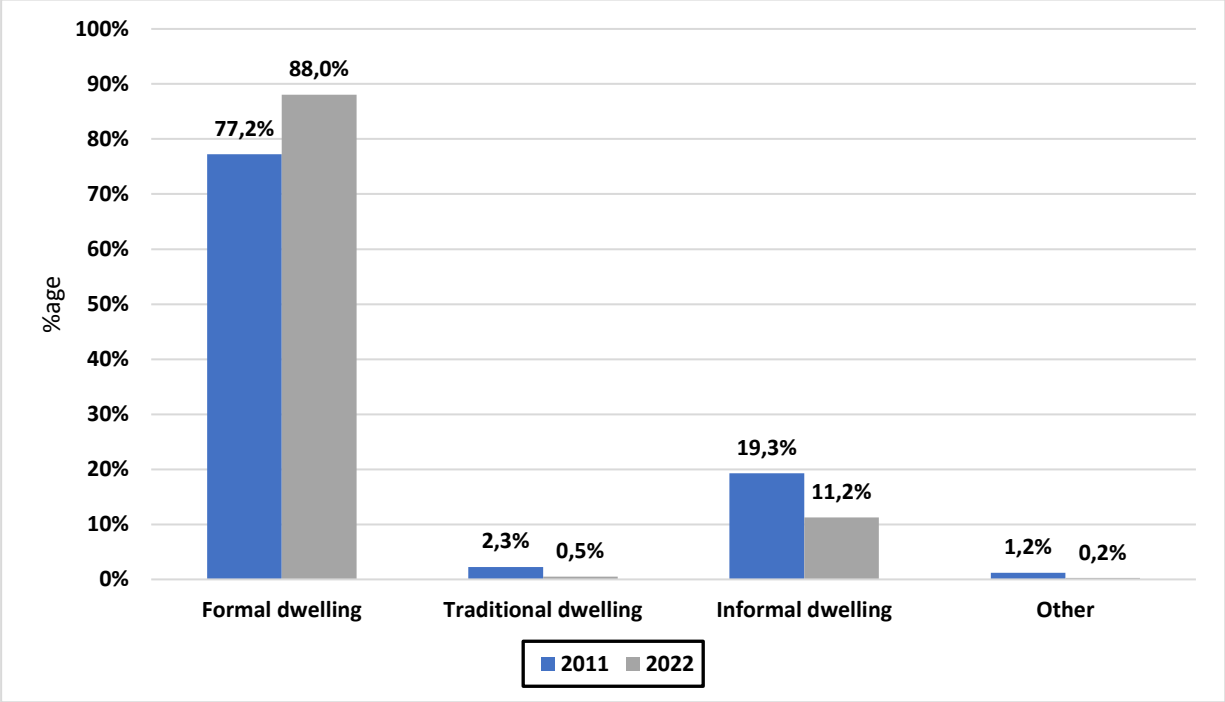


Figure 23: ELM Dwelling Types (Census 2011, 2022)

According to ELMs LED strategy 2018-2023, as a first step in the Informal Settlement Formalisation Programme, the areas in eMalahleni Municipality representing the major functional areas for the development of housing catering for the informal settlements should be identified and classified. Seven such areas of which Phola is one have been identified:

- Lynnville
- Kwa-Guqa/Hlalanikahle
- Pine ridge/Klarinet/Siyanqoba
- South Eastern Suburbs
- **Phola**
- Ga-Nala-Rietspruit
- Van Dyksdrift/Emagalasini

The basic principle is that each of these areas should, as far as possible, cater for the local housing needs, either by way of in-situ upgrading and/or local relocations. Long-distance relocations should be avoided as such relocations usually disrupt the existing social cohesion within the area, and also dislocate people from where they work. In many cases the solution is

temporary in nature as informal settlement frequently reoccur in the area from where people were re-located due to the inherent locational advantages of that specific site. Continuous land invasions lead to growing number of informal settlements and housing backlog (ELM Local Economic Development Strategy 2018 -2023).

According to the ELM IDP, the municipality is faced with the following human settlement challenges (ELM IDP 2024/25):

- has the largest number of spatially distributed informal settlements in the Province, totaling 72 spatially distributed informal settlements
- Continuous illegal occupation of land
- Increased protests for land for residential purposes
- A huge housing backlog estimated at 48 000 households requiring housing assistance
- Inadequate allocation of houses: having an impact in addressing the housing backlog
- Slow pace in the delivery of houses and the incompetence of contractors appointed year on year
- Unavailability of adequate bulk services in areas earmarked for housing development e.g. informal settlements in process of formalization; IRDP / “Greenfield” housing projects)
- Unavailability of serviced land for the “Gap Market”, and for relocation of informal settlements situated on land not suitable for human habitation
- Incomplete township establishment processes in areas earmarked for housing development, resulting in delays on the Title Deed Restoration Programme
- Resistance from certain communities earmarked for relocation.

4.10.2 Roads and transport system

The road challenges in ELM and Phola include dilapidated and uneven gravel roads, dilapidated surfaced road infrastructure and inadequate stormwater capacity and ineffective drainage system.

ELM manages and maintains the road and storm-water infrastructure network of 1400.08 km and network distribution per area can be as per the Table 21 below:

Table 21: Road Types in ELM

Area	Surfaced Roads (km)	Gravel Roads	Block Paved	Concrete Paved	Total (km)
eMalahleni	483.08	80.32	4.61	0.6	568.60
Clewer	8.24	29.01	2.48	0	39.73
Kriel	82.72	5.45	0.1	0	88.27
KwaQuga	62.81	243.06	5.13	0	311
Lynnville	68.51	67.19	19.68	0	155.38
Ogies	4.23	0	0	0	4.32
Paxton	12.07	5.64	0	0	17.72
Pine Ridge	9.54	29.19	4.08	0	42.81
Rietspruit	25.01	2.71	0	0	27.72
Thubelihle	22.39	3.77	0	0	26.16
Wilge	8.03	0.25	0	0	8.28
Wolwekrans	13	90.25	6.83	0	110.09
TOTAL	**799.72 KM**	**556.84 km**	**42.91 km**	**0.6 km**	**1400.08 km**

4.10.3 Health care facilities

Public health infrastructure is a fundamental pillar to building a successful national health system. However, according to the National Service Delivery Agreement, the current public health infrastructure cannot adequately support the service delivery needs of the country. Health facility planning, including providing new hospitals and clinics and upgrading established facilities, needs to be expedited to increase citizen's access to a high standard of health care facilities.

In total, the Nkangala district has 117 Health care facilities, which include 74 clinics, 22 Community Health Facilities, 8 District and Tertiary hospitals and 13 "other" hospitals. The largest number of facilities are concentrated in the Dr JS Moroka and eMalahleni LMs, with a total of 32 and 28 facilities, respectively. It is important to note that the district does not have a single regional hospital. These are hospitals with higher capacity and serve a larger area than a local hospital. A new Witbank Tertiary Hospital is currently under construction. As of March 2018, eMalahleni has (Table 22):

Table 22: Health Care Facilities in ELM (Nkangala District Municipality (DC31) District Health Plan 2019/20-2021/22)

Clinics	14
CHC/CDC	5
District Hospital	1
Regional Hospital	
Central Tertiary Hospital	1
Other Hospitals	7

In August 2023, Seriti and the Department of Minerals and Energy (DMRE) handed over a state-of-the-art community health centre to the Mpumalanga Department of Health in eMalahleni and the Phola community in Makause Section. The centre, which is already operational, was built at a cost of around R20 million contributes to better healthcare as well as local economic development in the area (Seriti, https://seritiza.com/news-media/announcements/2023/seriti-hands-over-a-community-health-centre/).

The health facility provides three streams of care:

- Preventative – including maternal and child health, health counselling and monitoring
- Chronic – including primary healthcare consulting and dental care
- Acute – including emergency services.

In NDM, the leading cause of death amongst the 25-64 age group is Non-Communicable Diseases (NCD), although only marginally in comparison with HIV and Tuberculosis (32%) as the cause of death. NCD was the leading cause of death among 35% of those aged 25-64 during the period 2011-2015 as was the case during the period 2006-2010 at 33%. Injury was the leading cause of death for the 15-24 age group at 40% during the 2011-2015 period. As is the case in other districts, Non-Communicable Diseases (NCD) is almost exclusively the leading cause of death among the 65+ age group being the cause of death for 76% during the 2011 – 2015 period. The maternal, perinatal and nutritional conditions is quite high as the leading cause of death among those aged 5 years and below at 73% during 2011-2015 period, thus making this condition one of the three main cause of death in the district, i.e., NCD (44%), HIV and TB (30%) and maternal, perinatal and nutritional conditions (22%).

It is important to note that Non-Communicable Diseases (e.g. cardiovascular diseases, cancers, chronic respiratory diseases and diabetes**)**, TB and maternal, perinatal and nutritional conditions appear to be the main causes of mortality in the region and therefore by inference in ELM and Phola. Whilst the offset projects by nature are intended to improve air quality and hence will assist in easing the symptoms of diseases such as chronic respiratory diseases and TB, it is still recommended that Eskom factors this into the design of appropriate offset programmes.

4.10.4 Education facilities

The NDM has 502 schools spread across the six Municipalities. Of the 502 schools, 133 are Secondary Schools, 13 are Combined Schools whilst 356 are Primary Schools. There are 20 Circuits in the District with Dr JS Moroka and Thembisile with the highest number of Circuits.
One of the two campuses of the University of Mpumalanga is also located in this district, in the town of Siyabuswa, under the Dr JS Moroka Local Municipality, commonly referred to as the Siyabuswa Campus. The other tertiary institution is the Nkangala TVET College, which was formed in 2003 with the merger of Witbank, Middelburg, Mpondozankomo and CN Mahlangu campuses (formerly Technical Colleges).

Waterval Boven Campus was transferred in 2011 from Ehlanzen FET College. The College is the largest educational institution in the Mpumalanga Province, serving the community of the Nkangala region. CN Mahlangu and Waterval Boven are the predominately rural.

There are 34 Pre-Schools, 27 Primary Schools, 20 Secondary Schools, 16 Combined Schools and about 5 Tertiary Education facilities in the ELM. Most of the educational facilities are concentrated in the major towns, while there are some combined schools serving the rural areas. According to Schools4SA (https://www.schools4sa.co.za/province/mpumalanga/ogies/), the following schools are available in and around Phola:

Table 23: Schools near Phola (Schools4SA)

School Name	Suburb / Township	Phase	Specialisation
Gekombineerde Skool Ogies	Ogies	Combined School	Ordinary
Mabande Comprehensive High School	Phola	Secondary School	Ordinary
Mehlwana Secondary School	Phola	Secondary School	Ordinary
New Largo Primary School	Voltargo	Primary School	Ordinary
Sibongindawo Primary School	Balmoral	Primary School	Ordinary
Straffontein Primary School	Ogies	Primary School	Ordinary
Thembelihle Primary School	Wilge	Primary School	Ordinary
Thuthukani Primary School	Phola	Primary School	Ordinary
Wccm Primary School	Wilge	Primary School	Ordinary
Siyathokoza Primary School	Phola	Primary School	Ordinary

4.10.5 Community Centres

ELM does not have museums, galleries and zoos. However, it does have libraries, community facilities like halls, sport facilities and a theatre. The municipality has seven community halls and they are used for different purposes. Some of the usages of the halls include weddings, church services, community meetings and social gatherings. The theatre is primarily used to ensure that development, nurturing and promotion of arts and culture in all relevant discipline / genre is upheld and to ensure that development workshops are being held where youth (ELM, https://.gov.za/v2/community-service).

The Civic Theatre is located in the CBD, while seven community halls and two Multi-Purpose/ Thusong Centres also exist in other parts of the Municipality. The highest concentration of municipal and government buildings is in eMalahleni City, with limited facilities situated in Lynville, Hlalanikahle, Kwa-Guqa, Ga-Nala, Rietspruit, Phola and Ogies.

ELM has various sports and recreation facilities that include, Sy-Mthimunye Stadium which is vandalised, and the municipality is sourcing funds for the refurbishment of the stadium. The Pineridge stadium, which was completed during 2015/16 financial year, Lynville stadium,

Mpumelelweni, Thubelihle, Rietspriut sporting field, Phola combo courts, Puma rugby stadium, cricket stadium, Witbank tennis stadium, Netball court, Springbok field and boxing club which require maintenance, upgrading and refurbishment.

In summary, ELM has (Table 24):

Table 24: Summary of Community Services in ELM (ELM SDF,2023)

	Pre-School	Primary	Secondary	Combined	Tertiary	Hospital	Clinic	Police	Emergency Services	Library	Thusong Centre (MPCC)	Post Office	Community Hall
Emahlaleni	10	9	6	3	3	5	4	1	3	2		2	1
Lynville	2	3	3	7		1	3		1	1		1	2
Hlalanikahle	4		1				1			1	1		
Kwa-Guqa	6	5	5	1			2	1		1			
Sinqobile							1						
Klarinet		1	1	1	1		1			2	1		1
Subtotal Ema	**22**	**18**	**16**	**12**	**4**	**6**	**12**	**2**	**4**	**7**	**2**	**3**	**4**
Phola	4	4	2				1	1		1			
Ogies	3			1			1	1		1		1	
Subtotal Phola/Ogies	**7**	**4**	**2**	**1**	**0**	**0**	**2**	**2**	**0**	**2**	**0**	**1**	**0**
Ga-Nala/Thubelihle	2	4	2				2	1	1	2		1	2
Subtotal G/T	**2**	**4**	**2**	**0**	**0**	**0**	**2**	**1**	**1**	**2**	**0**	**1**	**2**
Rietspruit				1			1						1
Van Dyksdrift	3			1			1						
Wilge				1			1			1			
Subtotal Rural	**3**	**0**	**0**	**3**	**0**	**0**	**3**	**0**	**0**	**1**	**0**	**0**	**1**
Total	**34**	**26**	**20**	**16**	**4**	**6**	**19**	**5**	**5**	**12**	**2**	**5**	**7**
Mobile													

Note: non-urban includes Kriel Non-Urban, Van Dyksdrift, Rietspruit, Wilge

4.11 WASTE SERVICES

ELM renders kerbside refuse removal services to a total of 68, 7% of the housing population, with remainder of 31.3% households, predominantly informal settlements receiving a minimum level of service in the form of mass containers removal and communal dumping points. Illegal dumping, shortage of waste management resources, refuse collection backlogs are some of the main challenges facing the department responsible for waste management.

According to Statistics South Africa, Census 2011 and 2022, ELM waste disposal is characterised in the graph below. Whilst majority of the waste is removed at least once a week by local authorities, it maybe suggestive that this occurs mainly in the urban areas rather than the informal settings. A significant percentage, at least 20% and 10% perform their own refuse disposal and have no access to waste disposal respectively. It may be inferred that the percentages in terms of the type of waste disposal for Phola may be skewed towards own and no refuse disposal. This is an important assertion, that has to be tested in the next phases because inappropriate or inefficient waste management strategies result in illegal dumping and waste burning which disproportionately contributes to air pollution and will inform the offset strategy for Eskom.

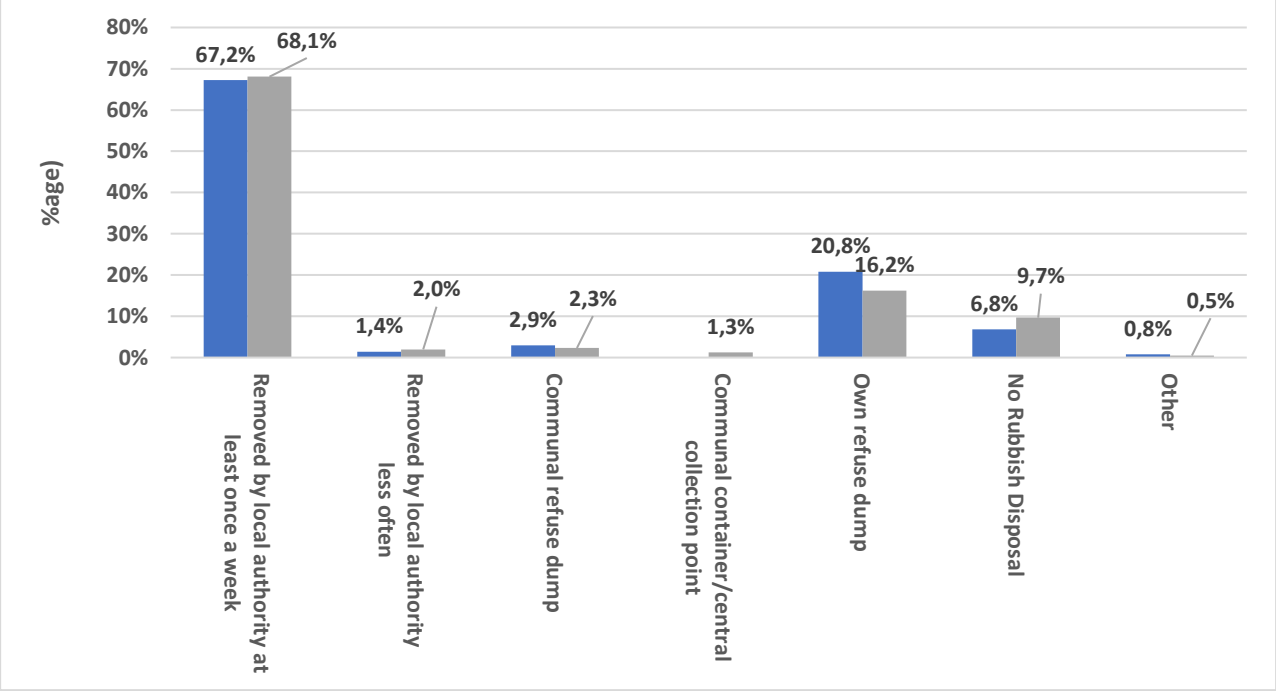


Figure 24: ELM Waste Disposal Characterisation

ELM recognises the following challenges related to waste management:

- Dilapidated and inadequate refuse removal fleet
- Unprotected environmental infrastructure
- Shortage of resources to deliver services
- Lack of infrastructure to promote recycling and waste recovery

- Illegal dumping.

There are several initiatives that the municipality, through the department of waste management, embarks on in order to improve the waste management services, such as:

- Implementation of the Adopt a Spot policy with the assistance of enviro groups to eradicate illegal dumping spots
- Establishment of the Environmental and Waste Management Committee to foster public participation on matters affecting the environment
- Conducting quarterly waste and awareness education programmes
- Conducting monthly clean up campaigns involving environmental groups
- Partnering with private sector in the construction of waste recycling facilities, landfill infrastructure, purchase of tools and equipment and implementing clean-up programs
- Participate in the Mayoral “Operation Hlanzeka” and other programmes conducted by Nkangala District, Provincial and National Government on waste management, such as the Good Green Deeds Programme, the Youth Jobs in Waste Programme, Clean City and Arbor City Awards Programmes.

Eskom should investigate these initiatives further and work collaboratively with ELM when developing the offset projects to extract synergies.

4.12 WATER AND SANITATION

4.12.1 Water Services

eMalahleni Local Municipality (ELM) is a Water Service Provider (WSP) according to Water Services Act number 108 of 1997 and appointed as Water Services Authority (WSA) by the Provincial Department of Water and Sanitation (DWAS). The function of WSP is to provide water services to the local municipality that is sustainable, efficient, good quality, and support local economic growth. WSA is responsible for the following:

- Ensure access to efficient, affordable, economical and sustainable access to water services to all consumers
- Prepare water services development plan
- Makes bylaws
- Decide on mechanisms for water services provision (ELM IDP 2024/25).

ELM is a water stressed mining town and has a challenge of an ever-growing water demand. The Olifants River is the main source of surface water supply to the municipality, supplying more 70% of municipal water provision capacity. ELM is located along the Upper Olifants River catchment and it has a catchment of approximately 3540km^2. The catchment land-use activities is inundated with coal mining, energy generation and agricultural land-use activities which have adverse effects on the deterioration of resource water quality. The municipality has been unable to exploit underground water resources due to underground coal mining which results to generation and decanting of acid mine drainage.

ELM water supply has the following challenges, which contributes to the persistent shortage of water:

- Water security (demand higher than supply)
- High water interruption resulting in water losses
- Intermittent water supply due to shortage of bulk water supply
- Deteriorating raw water quality
- Aged infrastructure, mostly asbestos.
- Vandalism and theft
- Inadequate budget for infrastructure development and maintenance
- Poor customer satisfaction leading to low revenue collection

ELM has three municipal water supply schemes (Witbank, Rietspruit and Ga-Nala) and three external (Anglo, Glencore and Eskom Kendal) responsible for bulk water provision. The municipal also has a modular package plant which is used to augment Witbank scheme.

Figure 25 below shows the percentage of households that have access to piped water in ELM. Whilst this has increased in 2022 compared to 2011, there has unfortunately been a corresponding increase in household without access to piped water during the same time.

The offsets projects must take cognisance of this unfortunate situation and factor it into the offset strategy should for example Eskom plan to roll out solar water heaters as a possible solution.

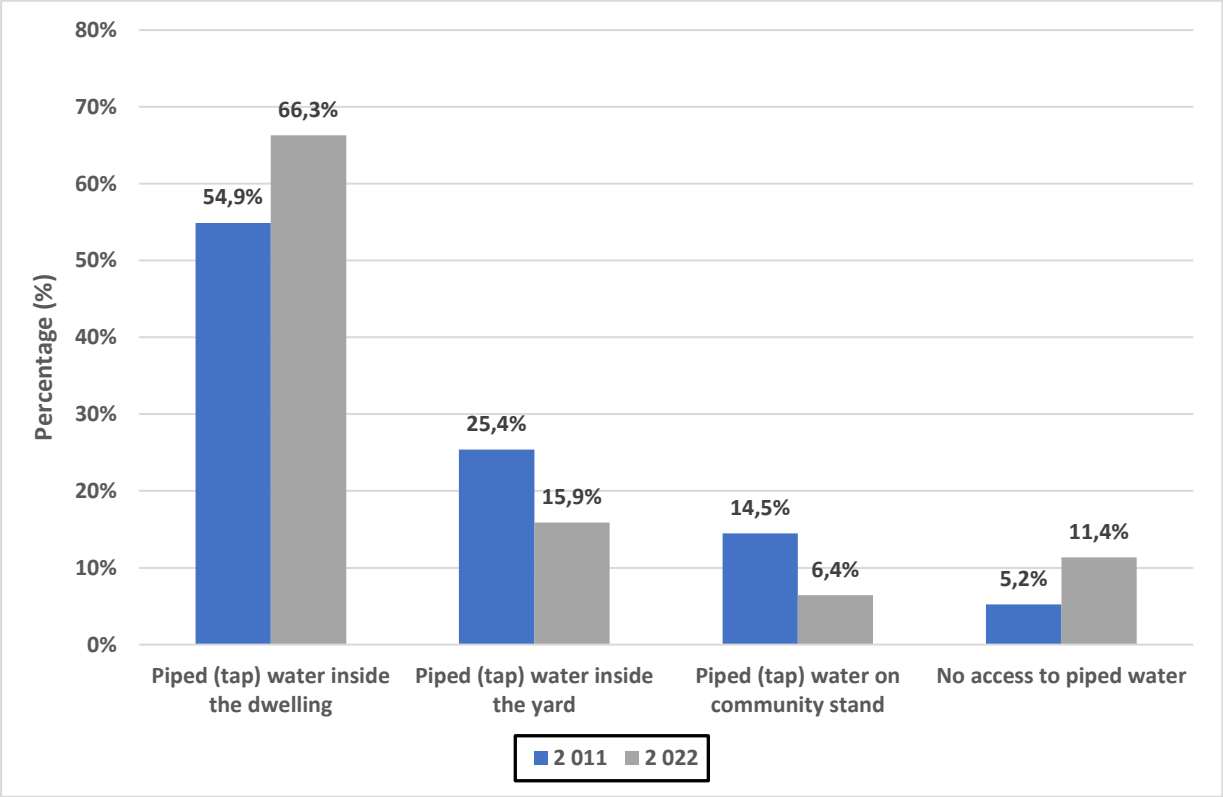


Figure 25: Access to Piped Water (Census 2011, 2022)

4.12.2 Sanitation Services

ELM operates with eight (8) Wastewater Treatment Works (WWTW). The sewer network has 1700km of pipelines with 27 pump stations within the network. Some components of old townships establishment are of Clay Pipes. There are areas which are still using septic tanks within the municipality averaging number of 630 units. All the rural areas and informal settlement use pit latrines estimated at 30000 units (ELM IDP 2024/25).

The current challenges and problems with water and sanitation for the municipality is triggered by factors such as:

- Imbalance between the demand and supply (Increased in water demand)
- Overloading of systems
- Distribution losses (about 42%)
- Ageing and outdated technology
- Lack of proper maintenance teams (incl. equipment & tools)

Figure 26 below shows the toilet facilities used by households in ELM. Whilst over 70% use flushing toilets, concerningly pit latrines have still not been eradicated and represent 20% of households that are exposed to this.

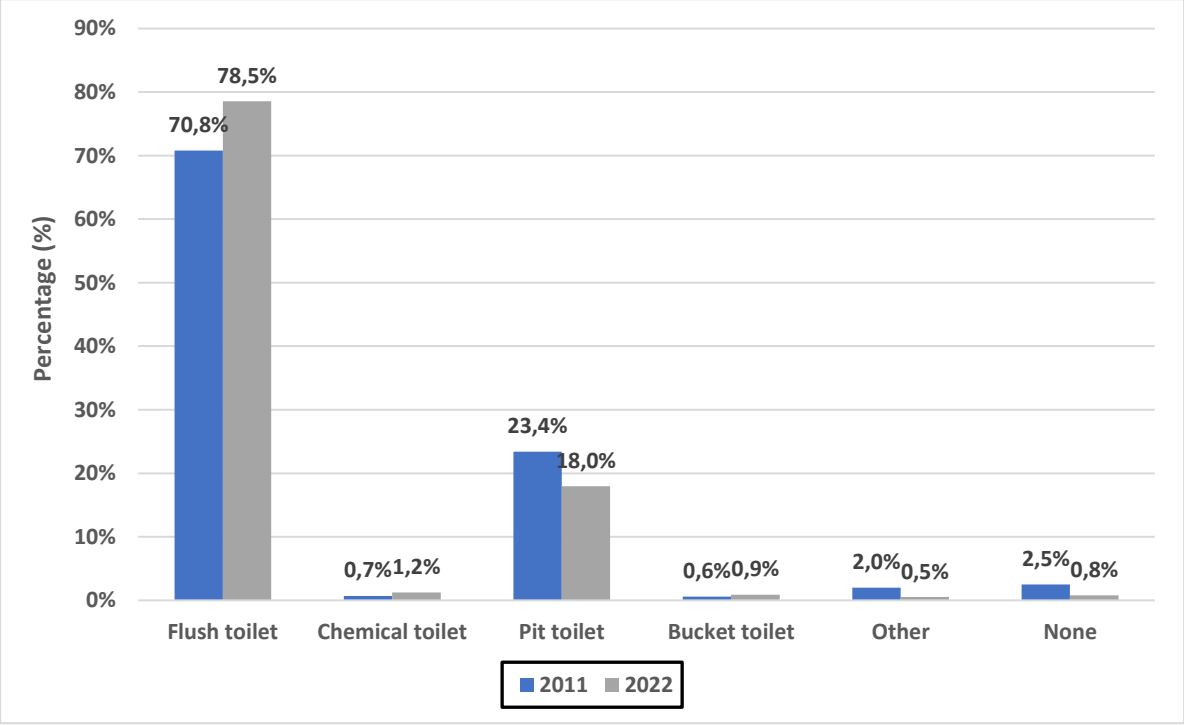


Figure 26: Household Toilet Facilities (Census 2011, 2022)

4.13 ENERGY

From the data obtained from Census 2022, the energy use by fuel type for cooking and lighting is shown in Figure 27 below:

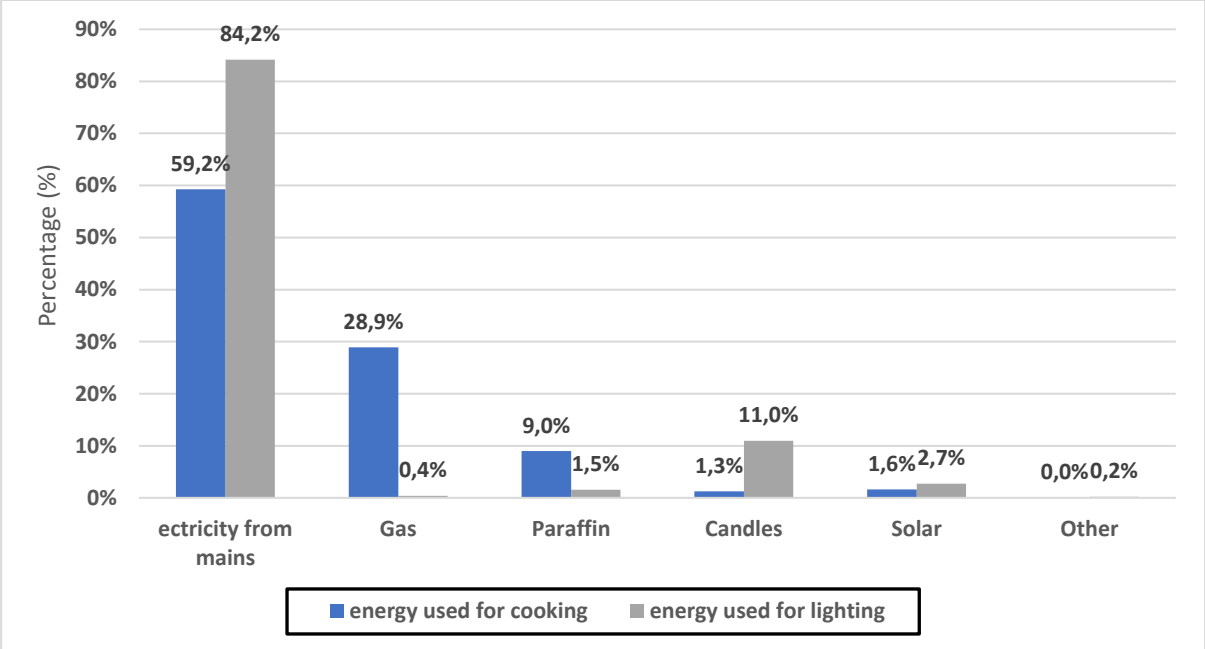


Figure 27: Energy use by Fuel Type in ELM (Census 2011,2022)

It is evident that electricity is the primary energy source for cooking and lighting and presumably heating in ELM. Gas also features prominently in its use for cooking which may make adoption of LPG offset solutions easier.

According to the ELM IDP 2024/25, Phola has a nominal maximum demand and utilised electricity capacity of 6000 MW.

The choice of energy carrier is often influenced by household income levels. Such that those in the lower income brackets who cannot afford cleaner energy sources such as electricity and LPG tend to use dirtier fuels such as cola, wood and dung. Without data points to support, ARM submits that given the proximity to abundant coal, Phola residents are probably more likely to consume coal for heating and cooking. This theory, however, will need to be corroborated with further studies and household surveys in the area.

4.14 Potential Growth Footprint Of The Township

Proclaimed as a Priority Human Settlements and Housing Development Areas (PHSHDA) on 15 May 2020 by the National Department of Human Settlements (DHS), the Phola/Ogies PHSHDA is situated roughly in the centre of the eMalahleni Local Municipality, approximately 27 kilometres south-west along the N12 and approximately 24 kilometres south-west of KaQuga. The N12 bisects the PHSHDA, with the settlement of Phola to the north and Ogies to the south. The entire PHSHDA is approximately 5,522 hectares in extent and comprises wards 28, 30 and 31 of the eMalahleni Local Municipality.

The Phola/Ogies PHSHDA is situated in an area that has experienced a massive increase in coal mining over the past two decades. The current land use within the PHSHDA and immediate surrounding area consists mostly of mining (central and south) and agriculture (to the north) with the settlements of Phola and Ogies situated in between these uses. Ogies includes a small commercial/industrial component. Both the settlements of Phola and Ogies contain a large component of “informal” land uses and informal settlement. Phola especially attracts informal settlers, and the town has quadrupled in size over the past two decades.

Housing Demand in eMalahleni Local Municipality has 72 incidences of informal settlement located in various parts of the municipal area. These represent a total of 34 097 units which are mostly clustered around the following areas:

- Area 1: KwaGuqa-Empumeleweni (12,965 Units)
- Area 2: Ackerville-Lynnville (10,193 Units)
- Area 3: Pine Ridge-Klarinet (1,309 Units)
- Area 4: Spring Valley-Naauwpoort (4,459 Units)
- **Area 5: Phola (2,828 Units)**
- Area 6: Central Mining Belt (2,343 Units) in southern parts of the ELM

It should be noted that Areas 1, 2, 3 and part of Area 4 are located in the City Priority Housing Development Area (PHSHDA), while Area 5 forms part of the Phola-Ogies Priority Housing

Development Area. If the ELM Housing Waiting List is added (18,532 units), then eMalahleni Municipality has an estimated housing demand of approximately 52,629 units.

The eMalahleni Spatial Development Framework 2023/24 proposes an Extended residential density plan to include the new formal townships with residential erven such as:

- Duvhapark extensions
- Klarinet
- Siyanqoba Extension 1
- Kwa-Guqa
- Empumelelweni various extensions
- New Phola extensions Phola Extension 1 and 7 (including formalization areas) and future residential expansion areas
- New Thubelihle and Ga-Nala Extensions
- Proposed Ogies Residential Expansion (Grootpan)

The main objective in Phola is to capitalize on regional traffic along the N12 freeway and to earmark suitable land for residential expansion. It has been proposed that the land adjacent to route R545 from the N12 freeway to Phola be earmarked for commercial, industrial and mixed-use development to capitalize on visual exposure to, and physical access from the regional road network. There is also potential to strengthen the two localized activity nodes in Phola, situated along the main collector road in Phola Proper and Phola Ext 1 respectively.

Future mining is planned to the east of the town, leaving no alternative but for Phola to expand to the west and north and south-east in future. Re-planning is required of Phola Extensions 3 and 5 due to the planned future mining activity. Council bought Portions 5, 6, and 7 of Wildebeesfontein to the north of Phola.

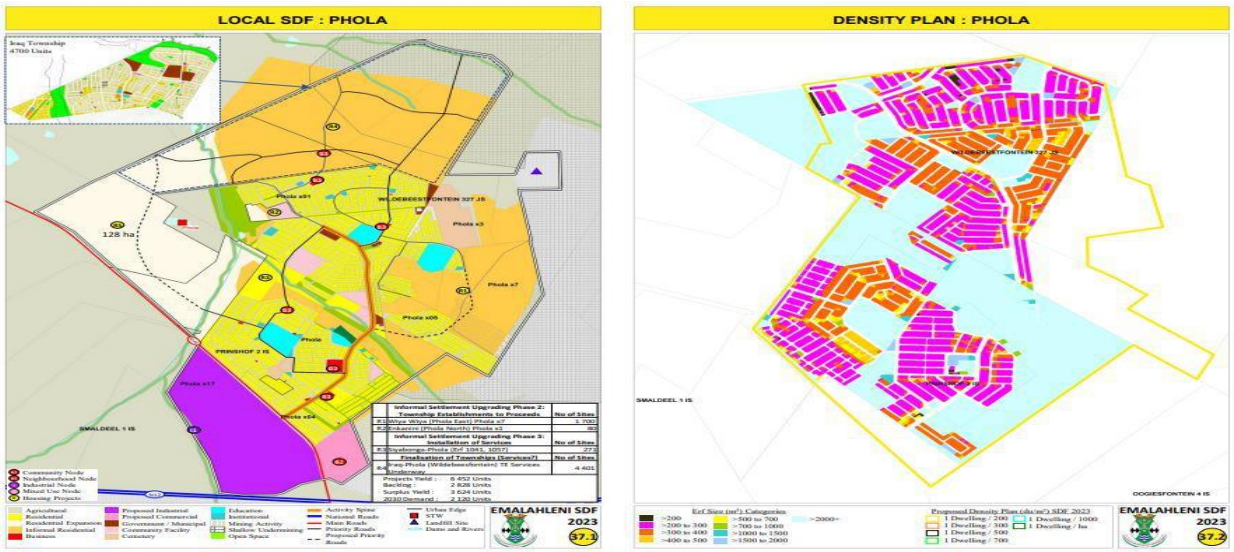


Figure 28: Phola SDF and Density Plan (ELM IDP 2024/25)

4.14 PLANNED ACTIVITIES

4.14.1 Intergovernmental Projects Both Public And Private Sector For Phola

The ELM IDP lists the following projects as key strategic projects in various stages of development and execution. ARM only presents the projects for Phola in Table 25 below. This provides useful insights for Eskom offsets to either leverage off, compliment or supplement ongoing initiatives by other corporates in Phola and ELM broadly.

Table 25: Strategic Projects in ELM

Implementing Entity	Project Title	Year	Value	Comment
DDM	Fly Ash Beneficiation Plant - Development of fly-ash beneficiation incubator using the ash from the Eskom power stations to manufacture value added products such as: cement, bricks, fertilizer etc.		R105 000 000	
Thungela Coal SA	Construction of light industrial park SMMES workshop	2023	R128 000 000	
Thungela Coal SA	Trauma centre	2025	R6 400 000	
Thungela Coal SA	Waste Management - Mini Transfer Stations	2019-2020	R 3 645 526	Greater ELM but important to leverage synergies for Eskom offsets
Seriti	Reseal 10km of Surface Roads	2022	R30 000 000	Greater ELM but important to leverage synergies for Eskom offsets
Seriti	Construction of paved roads in Siyanqoba (Access Roads)	2021	R8 500 000	Greater ELM but important to leverage synergies for Eskom offsets
Mpunzi	Infrastructure support to Basic services. Construction	2025	R9 000 000	
Glencore Mining	Ogies urban renewal and town upgrade	2022	R10 000 000	Reconstruction of road and drainage system and lighting

Implementing Entity	Project Title	Year	Value	Comment
Goedgevonden	Social cohesion Old age home at Phola	2024	R10 000 000	
Vlakfontein	Electrification of Phola houses	2019	R1 500 000	
Vlakfontein	Construction of 1km road at Phola	2020	R4 530 000	
Vlakfontein	Upgrade security at key strategic areas (CCTV)	2021	R4 000 000	
Vlakfontein	Refurbish/Upgrade and renovate sports ground/Facilities Phola and Ogies sports grounds/facilities)	2023	R2 800 000	
Sasol Mining	Agri Processing Hub	2022	R5 000 000	
Sasol Mining	Sanitation reticulation at Ext 6 Ga-Nala		R3 000 000	
Sasol Mining	Internal water and sanitation Reticulation in remainder of farm Rietkuil 558 (Ga- Nala)		R10 000 000	
Wescoal/Khanyisa Colliery	Construct 24 houses in insuit areas	2021	R12 200 000	
Wescoal/Khanyisa Colliery	Installation of main bulk water and refurbishment of reservoir	2022-2026	R3 000 000	
Wescoal/Khanyisa Colliery	Installation of water reticulation in Phola and New Extortions	2023-2024	R3 000 000	
Wescoal/Khanyisa Colliery	Construction of 1km roads and storm water, roadbed layer, concrete curbing, road marking, signage and installation of storm water drainage system	2024 - 2025	R4 000 000	

Implementing Entity	Project Title	Year	Value	Comment
OPSIREX (PTY) LTD	Electrification of 87 houses in Phola(Iraq Ext, of new stand)	2023	R2 000 000	
Beryl Coal Mine	Access to portable water		R3 000 000	

4.15 SECTOR LANDSCAPE

4.15.1 DEFF Regulatory & Policy Landscape

As indicated in the introduction section of this report, Eskom was granted a postponement of compliance timeframes and required to implement offset interventions. The postponement was granted as per regulations published in terms of section 21 of AQA i.e. Listed Activities and Minimum Emission Standards. As such, the implementation of offsets is governed by these regulations and other policies and regulations under the AQA. Any developments in such legislation will have an impact on the direction that companies take with regards to offsets. Specifically, the regulations and plans in Table 26 will have a bearing on offsets.

Table 26: Legislation and policies that have impacts on offsets

Legislation/policy	Description and Implications for offsets
National Framework Review and AQA Section 21 MES regulations	AQA Section 21 regulations set MES and set conditions for postponements, which are the basis for offsetting. The revised regulations suggest that no postponement will be granted beyond 2025. The implications of these for offsetting are uncertain. *Implications:* Any revisions to MES regulations may result in changes to offsets requirements. In light of the currently review of the National Framework for Air Quality Management, the project team forsee changes to Section 21 regulations around postponements, alternative limits and therefore offsets.
Revision of Highveld Priority Area (HPA) Air Quality Management Plan 7(AQMP).	DEFF has developed the draft HPA AQMP (unpublished). The AQMP define interventions that public and private entities must implement in order to improve air quality in the HPA.

Legislation/policy	Description and Implications for offsets
	Implications: The AQMP makes specific expectations and requirement for industries. Some of those requirements may be of more priority than offsets requirements. Thus, the type of requirements posed by the AQMP may affect Eskom's resource and financial prioritisation of offsetting vs other emission reduction interventions or affect prioritisation of location where offset interventions should be implemented.
Priority are regulations	The DEFF has published the draft Regulations for Implementing and Enforcing Priority Area AQMPs in August 2022. The purpose of the regulations is to ensure that conditions set out in the Priority Area AQMPs are legally binding. *Implications:* As per priority area AQMP above.
Strategy to Address Air Pollution in Dense Low Income Communities	The strategy sets out interventions that government and private sector needs to take in order to improve air quality specifically in low-income communities. Offsets are listed in the strategy as one of the means to achieve this objective. *Implications:* The strategy makes provision and recommendations for partnerships between government and private organisations such as Eskom. If implemented properly, such partnerships could yield up-scaling of existing and planned offsets projects.
Carbon offsets regulations	The regulations sets conditions under which carbon tax rebates can be claimed for implementation of certain carbon offsets. *Implications:* Eskom can consider community offsets projects that enable it to claim carbon tax allowance by implementing offsets that can have both AQM and climate change mitigation benefits.

Overall, the one major sectoral change during 2022-2024 period was the publication of the draft regulations for Implementing and Enforcing Priority Area AQMPs. The implications of these regulations for Eskom will only be fully understood once both the final regulations and the HPA AQMP are promulgated. The DFFE has also initiated the process of reviewing the National Framework for Air Quality Management, which may result in concomitant changes to the AQA Section 21 regulations, and subsequently, the legal standing of offsets.

So far, there was no information that suggests that these changes in legislation will affect Eskom's offsets implementation in eMalahleni. ARM will continue to monitor any developments on these and any other policies that may influence the implementation of offsets as the project continue.

4.16 Integrated Resource Plan (IRP)

South Africa's Integrated Resource Plan highlights the country's intentions to decommission various units of Eskom power stations (Kendal, Matla, Duvha) from as soon as 2030. This may have implications for the Phola community. Decommissioning not only affects jobs and the economy but drives people towards poverty and impacts both lives and livelihoods. As a result the long term sustainability of the offset initiatives may be affected.

4.17 Other Organizations Implementing Air Quality Offset Projects

As the name suggests, eMalahleni which means the "place of coal" is probably the most industrialised municipal area in Nkangala and its landscape features mainly underground and opencast coalmines. This area has the largest concentration of power stations in the country. For this reason, there are many corporates operating the area. Although, the MES do not necessarily apply to all of them, there are other regulations or policies that govern their industry e.g. the Mining Charter. Initiatives driven under these regulations may be complementary to Eskom's offset projects. Table 25 above list some of the initiates being undertaken by other organisations in Phola.

This information will be continuously updated as strides are being made to obtain further details. To ARM's knowledge, DEFF was supposed to keep offsets register which is a compendium of air quality offsets implemented in the country, as well as the implementation status and agent for each offset. Such a register is currently not available (to the public).

4.18 STAKEHOLDER ANALYSIS

The **key stakeholders** in **Phola,** are individuals, groups, and organizations that have an interest in or influence over the town's development, economy, and social dynamics. These stakeholders play an important role in shaping the future of the town, addressing challenges, and capitalizing on opportunities. Below are the key stakeholders for Phola:

4.18.1 Local Government Authorities

- **Local Municipality:** This is the primary governing body for the area, responsible for implementing local policies, urban planning, and the provision of essential services like water, sanitation, roads, and public health. The municipality also oversees economic development, local business growth, and community welfare in Phola.

- **Mpumalanga Provincial Government:** They play a role in regional planning, infrastructure investment, and policy implementation, especially in sectors like mining, energy, and land use. Provincial government policies impact Phola's development, especially in **terms of regulations for mining, housing, and environmental protection.**

4.18.2 Mining Companies and Industry

- **Coal Mining Companies:** The major coal mining companies operating in and around , such as Exxaro, Glencore, and BHP, are central to the economy of Phola. These companies provide direct employment and contribute to the local economy through taxes, local procurement, and community development programs.

- **Energy Companies:** Power generation companies, especially Eskom (South Africa's state-owned electricity supplier), which operates coal-fired power

stations in the region, are key stakeholders. Their operations impact both the local economy and the environmental quality of the area.

4.18.3 Residents and Community Groups

- **Local Communities:** The people living in Phola are directly impacted by local policies, economic activities, and the availability of services. Community groups, such as resident associations or informal settlement committees, represent the interests of the people living in the area, including the provision of housing, education, healthcare, and jobs.

- **Local Business Owners:** Small to medium-sized businesses that provide services and products to the local community, as well as larger suppliers that work with mining companies and energy firms, are vital to the town's economy.

4.18.4 Labor Unions and Employee Groups

- **Mining Unions:** Labor unions like the National Union of Mineworkers (NUM) play an important role in advocating for workers' rights, wages, safety standards, and benefits in the mining sector. The unions are influential in negotiating with mining companies and the government on behalf of the workforce in Phola.

- **Other Worker Associations:** In addition to mining-specific unions, other worker associations related to construction, services, and other sectors also have a stake in the town's development, particularly with regards to employment opportunities, working conditions, and social support.

4.18.5 Environmental and Advocacy Groups

- **Environmental NGOs:** Organizations such as Groundwork South Africa and Earthlife Africa focus on advocating for sustainable practices in the mining and

energy sector and addressing the environmental impacts of coal mining and power generation in the region. They push for environmental accountability and the transition to cleaner energy sources.

- **Community-Based Environmental Groups:** Local groups focused on reducing pollution, improving water and air quality, and mitigating the adverse effects of mining operations are also key stakeholders in advocating for the health and sustainability of Phola.

4.18.6 Education and Healthcare Providers

- **Schools and Educational Institutions:** Local schools and vocational training centers are stakeholders in developing the skills needed to support the mining industry and other sectors. The presence of institutions like technical colleges and high schools is vital for building a skilled workforce.

- **Healthcare Providers:** Local hospitals, clinics, and healthcare NGOs are important in providing healthcare services to Phola's residents, particularly with respect to the health challenges posed by mining activities, such as respiratory diseases and other health issues related to pollution.

4.18.7 Private Sector and Investors

- **Private Investors:** Individuals and firms that invest in infrastructure, housing, and business ventures in Phola, such as retail or service industry developments, are key stakeholders in the town's economic growth. Investors may focus on both the traditional sectors (like mining) and emerging industries (such as renewable energy or manufacturing).

- **Banks and Financial Institutions:** Banks and financial institutions provide funding for business development, infrastructure projects, and housing in Phola. They are critical in supporting economic growth and development initiatives.

4.18.8 National Government

- **Department of Mineral Resources and Energy (DMRE):** This department is responsible for regulating mining activities, energy policies, and ensuring that mining operations, including those in Phola, are compliant with national laws and standards.

- **Department of Forestry, Fisheries and the Environment (DFFE):** The DFFE oversees national environmental policies and regulations related to mining operations, energy production, and land use. They play a key role in monitoring pollution and promoting environmental sustainability in the area.

- **Eskom:** As a state-owned utility, Eskom is a significant player in the energy sector, which directly impacts Phola. Their decisions regarding coal-fired power plants, renewable energy projects, and electricity distribution are key to the town's economic and environmental future.

4.18.9 Tourism and Cultural Organizations

- **Tourism Stakeholders:** While not as prominent in Phola, there is potential for eco-tourism or cultural tourism initiatives that could involve local heritage sites or the natural beauty of the region. Local tourism boards or cultural organizations could help promote Phola as a destination for nature or history-focused tourism.

4.18.10 Media

- **Local and National Media:** Local newspapers, radio stations, and digital media platforms are important stakeholders as they help shape public opinion, raise awareness on local issues (like mining safety, labor disputes, or environmental

concerns), and inform the community about development projects or challenges facing the area.

The analysis below is ARM's view of stakeholders based on available literature and may not be exhaustive

4.18.11 Stakeholder MAP

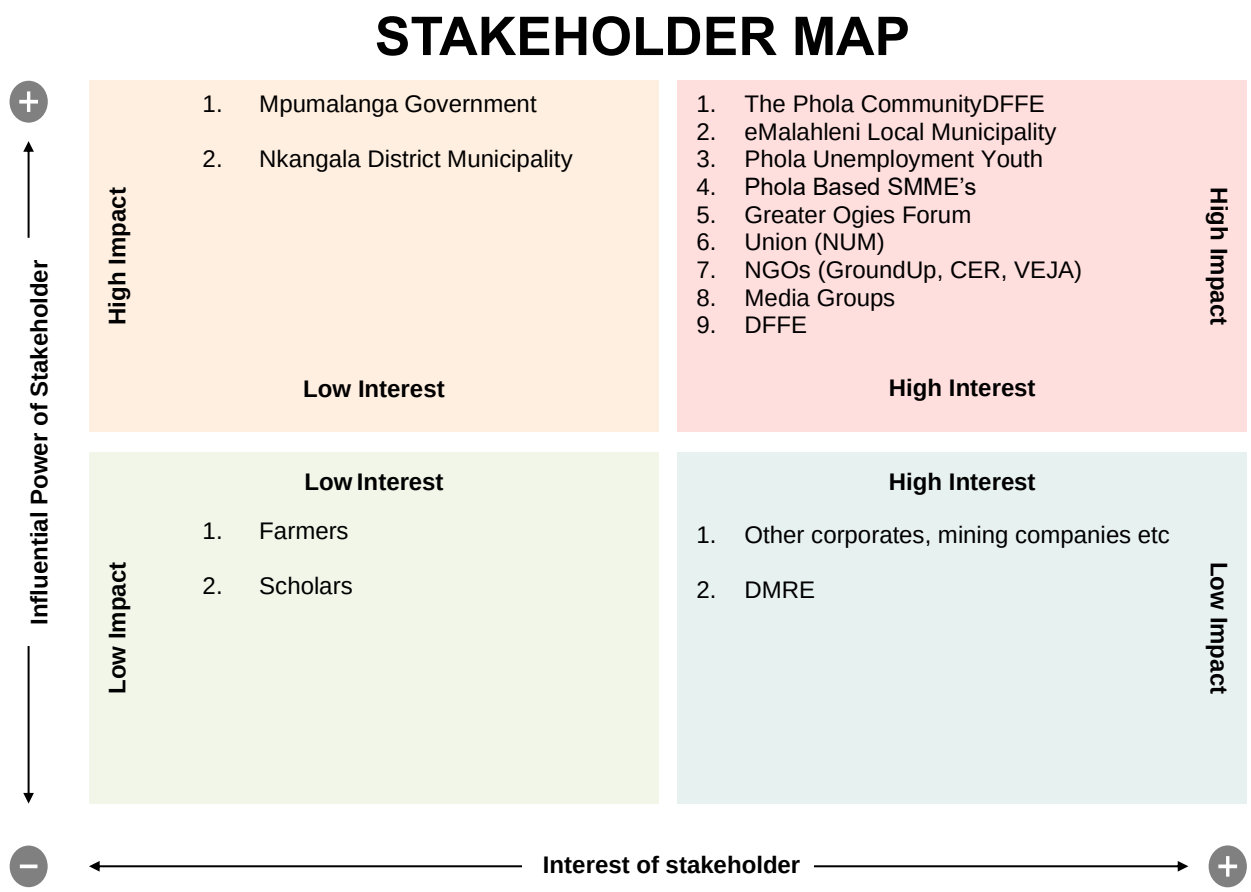


Figure 29: Phola Stakeholder Map

4.19 SWOT Analysis

4.19.1 Municipal-wide SWOT Overview

As part of the Study, a SWOT analysis was undertaken in order to understand different conditions that are favourable or unfavourable for implementation of offsets in eMalahleni. At a local municipal level, ELM had undertaken SWOT analysis as part of their IDP processes. Table 27 outlines the IDP-listed SWOTs that are relevant in the context of offsets.

Table 27: SWOT analysis undertaken by ELM for the IDP

SWOT	Description
Strengths	• Abundant Natural Resources such as coal • Strategic geographical location – major transport corridor • Industrial and mining industries • Seat of "Power" stations • Local workforce and skills
Weakness	• Over reliance on traditional industries • Limited economic diversification • Infrastructure gaps, unreliable • Weak Governance
Opportunities	• Land available for agriculture and agribusiness • Grow the renewable energy sector • Tourism industry potential
Threats	• Concentrated economy susceptible to economic downturn • Environmental pressure • High youth population • High unemployment rate • High crime • Coalition government – ANC not in majority

4.19.2 SWOT Analysis: Phola

A SWOT analysis for Phola would involve evaluating the **Strengths**, **Weaknesses**, **Opportunities**, and **Threats** related to the area, typically focusing on economic, social, and environmental aspects.

Strengths

1. **Strategic Location**:
    - Phola is strategically located in the heart of the coal mining region in Mpumalanga, which provides economic opportunities through its proximity to coal reserves and related industries.
    - Access to infrastructure like roads, railways, and a regional airport that facilitates transport for mining and industrial operations.

2. **Mining Industry Hub**:
    - The area benefits significantly from the mining industry, especially coal mining, which drives employment and economic activity.
    - Presence of large-scale mining companies creates opportunities for local businesses to supply goods and services.

3. **Infrastructure Development**:
    - has a relatively well-developed infrastructure in terms of power, water, and road networks. Phola, being a part of this region, can leverage this development for growth.

4. **Employment Opportunities**:
    - With the mining industry being a major employer in the region, residents have employment opportunities in mines and related sectors such as logistics, engineering, and manufacturing.

Weaknesses

1. **Environmental Challenges**:

- The region is highly dependent on coal, which leads to significant environmental concerns such as air pollution, land degradation, and water pollution from mining operations. This can impact the quality of life for residents and discourage investment in sustainable industries.

2. **Limited Economic Diversification**:
    - The economy of Phola is highly dependent on the coal mining industry. Limited diversification makes it vulnerable to fluctuations in the global demand for coal and shifts towards renewable energy sources.

3. **Underdeveloped Social Services**:
    - While the area has grown in terms of industry, social services like healthcare, education, and recreation may not be fully developed or accessible to all residents, especially in outlying areas.

4. **Infrastructure Overload**:
    - With the growth in industrial activity and population, the local infrastructure may become strained, leading to traffic congestion, power shortages, and challenges in water management.

Opportunities

1. **Economic Diversification**:
    - Phola could benefit from exploring industries beyond coal, such as agriculture, renewable energy, and tourism. The region's rich natural resources could support the development of renewable energy projects (such as solar and wind energy).

    - Development of local manufacturing and processing industries could reduce dependence on mining alone.

2. **Renewable Energy Potential**:

- With the global shift towards renewable energy, there is potential for Phola to become a hub for solar and wind energy generation, helping to address energy needs sustainably and create jobs in new sectors.

3. **Community Development**:
    - There is potential for the development of better educational institutions, healthcare facilities, and housing, improving the quality of life for residents.

    - Partnerships between government, business, and civil society can drive community empowerment projects.

4. **Tourism Development**:
    - If Phola and the surrounding area capitalize on its natural landscapes and cultural heritage, tourism could become a key growth sector. Eco-tourism and heritage tourism might attract visitors and create economic growth.

Threats

1. **Declining Coal Demand**:
    - The global shift towards clean energy sources could reduce the demand for coal, which may negatively affect Phola's economy, particularly as the area is heavily reliant on coal mining.

2. **Environmental Regulations**:
    - As environmental concerns grow, stricter regulations on mining and emissions could increase operational costs for companies, possibly leading to job losses or reduced economic output.

3. **Social Unrest and Strikes**:
    - Labor strikes, particularly in the mining sector, are common in South Africa and could disrupt local economies. Phola's reliance on mining could leave it vulnerable to labor disputes, which may impact income levels and stability.

4. **Rural-Urban Migration**:

- With the growing industrialization, there may be an influx of people into Phola, which could lead to overcrowding, pressure on local services, and an increase in informal settlements, which the town may not be adequately prepared for.

4.19.3 PESTLE FOR PHOLA

A **PESTLE analysis** examines the external macro-environmental factors that could impact a location, such as **Phola**. This analysis considers **Political**, **Economic**, **Social**, **Technological**, **Legal**, and **Environmental** factors that shape the area's development.

Political Factors

1. **Government Policies**:
    - Phola benefits from national and provincial government support for mining, energy, and infrastructure development. However, changing policies toward cleaner energy, like phasing out coal, could affect the local economy, which heavily relies on coal mining.
    - Political instability and policy changes at both the local and national levels can impact investment, economic development, and business confidence in Phola.

2. **Mining Regulations**:
    - The South African government has introduced policies regarding the mining industry, including regulations about health, safety, and environmental standards. The impact of such policies can shape the economic prospects of the region and the profitability of coal companies operating in the area.

3. **Local Government Engagement**:
    - The effectiveness of the local municipality in managing resources, urban planning, and public services (such as health, education, and infrastructure) influences the

quality of life in Phola. Public service delivery might be under strain from the demands of industrial growth.

- Phole, ELM has seen the ANC lose its majority to Independents and the formation of a coalition government. Eskom would need to manage these stakeholders carefully due to the differing ideologies and policies.

Economic Factors

1. **Mining Dependency**:
    - The economy of Phola is heavily dependent on coal mining, which provides a large number of jobs and drives local industry. However, fluctuations in coal prices on the global market could directly affect local income, employment levels, and business activity.

2. **Unemployment Rates**:
    - While the mining sector creates job opportunities, the region's overall economic growth may be limited due to low diversification. A lack of alternative industries could exacerbate unemployment if the demand for coal declines or mining operations is scaled back.

3. **Economic Diversification**:
    - The region's limited diversification outside of mining presents an opportunity and a challenge. Economic diversification into sectors like renewable energy, agriculture, or manufacturing could reduce vulnerability to shifts in the coal market, though such diversification requires significant investment.

4. **Infrastructure Investment**:
    - Investment in infrastructure (roads, utilities, and social services) can stimulate local economic growth and improve business conditions. Phola could see economic benefits from improved roads and facilities that serve the needs of both the industrial and residential communities.

Social Factors

1. **Population Growth & Migration**:
    - Phola is likely experiencing population growth due to migration from rural areas to urban centers in search of jobs in the mining sector. This can lead to pressures on local housing, healthcare, and social services, creating challenges for the community.

2. **Education and Skills Development**:
    - The availability of skilled labor is essential for the area's continued industrial and economic growth. Enhancing educational opportunities and vocational training, especially for mining and engineering skills, is crucial to developing the local workforce.

3. **Community Health & Welfare**:
    - Air pollution and water contamination from mining activities can have adverse effects on the health of residents. Ensuring access to healthcare and addressing the social issues arising from mining (like accidents, diseases, and poverty) are important for social stability.

4. **Cultural Heritage**:
    - The cultural diversity of the population could lead to opportunities for community-based tourism or initiatives aimed at preserving and promoting local traditions and heritage. This can also help in fostering social cohesion in a rapidly developing town.

Technological Factors

1. **Mining Technology**:
    - Advancements in mining technology (e.g., automation, renewable energy integration) could make mining operations in Phola more efficient. However, the introduction of automation could lead to reduced job opportunities for local workers if alternative industries are not developed.

2. **Energy Innovation**:

- The energy transition away from coal could drive technological developments in renewable energy, such as solar, wind, and energy storage. This could provide opportunities for Phola to diversify into the renewable energy sector, attracting investment in new technologies.

3. **Digital Connectivity**:
    - Improved internet and communication infrastructure in Phola could encourage businesses in other sectors to invest in the area, creating a more robust economy. Access to high-speed internet would also improve education, healthcare, and local governance.

Legal Factors

1. **Mining Regulations & Labor Laws**:
    - South Africa has strict labor laws and mining regulations that govern worker safety, wages, and working conditions. Changes in labor laws, particularly regarding worker rights in the mining industry, can impact local employment practices and the attractiveness of Phola as a labor hub.

2. **Environmental Legislation**:
    - South Africa's environmental regulations, aimed at reducing the environmental impact of mining, will likely affect the future of coal mining in Phola. Laws targeting carbon emissions, water use, and land reclamation could force mining companies to adopt cleaner technologies or pay for environmental damages.

3. **Property & Land Use Laws**:
    - Property laws and land use regulations are important in a town like Phola, where urbanization and industrial expansion are significant. Legal frameworks that support sustainable urban planning will be crucial for managing population growth and preventing informal settlements.

Environmental Factors

1. **Mining's Environmental Impact**:

- The coal mining industry's environmental footprint in Phola includes air pollution, water contamination, and habitat disruption. As the world moves toward cleaner energy solutions, these environmental challenges could spur local resistance, particularly from environmental advocacy groups.

2. **Climate Change and Resource Depletion**:
    - Climate change and the depletion of local natural resources (such as water and arable land) could create long-term challenges for Phola. Adaptation to climate change, including measures to reduce water and energy consumption, will be necessary to ensure the town's sustainability.

3. **Renewable Energy Potential**:
    - Given South Africa's strong potential for solar and wind energy, Phola could benefit from the development of renewable energy projects. These projects would diversify the region's energy mix, reduce reliance on coal, and offer economic opportunities in sustainable industries.

5. CONCLUSION

In conclusion, the Stakeholder Mapping and SWOT analysis for eMalahleni, along with its implications for Phola, sheds light on the multifaceted landscape that Eskom must navigate in its efforts to implement effective offsets. The identification of key strengths provides a foundation for leveraging community assets, while the weaknesses highlighted point to areas requiring strategic intervention. However, the primary concerns stemming from the growing youth population, high unemployment, and increasing crime rates present significant challenges that could hinder progress and sustainability of solutions. To mitigate these threats, it is essential for Eskom to collaborate closely with local stakeholders, invest in community development initiatives, and create pathways for economic participation and empowerment particularly of woman and youth. By addressing these social and economic challenges head-on, Eskom can not only ensure the success of its offsets but also contribute positively to the overall resilience and sustainability of both eMalahleni and Phola.

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ANEXURE 1

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