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**Final (May 2024)**

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**HARRY GWALA DISTRICT GREEN ECONOMY STRATEGY 2024/2025 to 2028/2029**

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HGDM Vision:

“By 2030 Harry Gwala District Municipality will be a leading water services provider in the whole of KZN with its communities benefitting from a vibrant agriculture and tourism sectors” (IDP 2021-2027)

“By 2050, sustainable Growth and Development in the Harry Gwala District Municipality will have significantly improved the quality of life of its people” (DDM, 2023)

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HGDA Vision:

*“A polycentric resource abundant investment Gateway, with absolute transformative*

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**List of acronyms**

<b>ACRONYM</b>	<b>DESCRIPTION</b>
HGDM	Harry Gwala District Municipality
HGDA	Harry Gwala Development Agency
ESD	Eastern Seaboard Development Region -as an area
ESRSDF	Eastern Seaboard Regional Spatial Development Framework
RE	Renewable Energy
EDTEA	Department of Economic Development, Tourism & Environmental Affairs (KZN)
SANBI	South African National Biodiversity Institute
EKZNW	Ezemvelo KZN Wildlife
LM	Local Municipality
L.E.D.	Local Economic Development
IDP	Integrated Development Plan
DDM	District Development Model
PGDP	Provincial Growth and Development Plan
PGDS	Provincial Growth and Development Strategy
NDP	National Development Plan
LM	Local Municipality
SDBIP	Service Delivery and Budget Implementation Plan
EIA	Environmental Impact Assessment
WULA	Water Use License
SPLUMA	Spatial Planning and Land Use Management Act, 2013
DRNDZLM	Dr. Nkosazana Dlamini Zuma Local Municipality
GKLM	Greater Kokstad Local Municipality
SONA	State of the Nation Address (by President)

# GREEN ECONOMY STRATEGY OF THE HARRY GWALA DISTRICT MUNICIPALITY

## 1. Introduction

### 1.1. Problem statement

It has been predicted that energy demand within South Africa is expected to rise steadily and double by 2025. The current coal-fired power stations are not coping with the demand. There is a need for innovative solutions towards an alternative “energy mix”. Climate change also poses further challenges both in rural and urban areas. The HGDM area has both urban centres and rural nodes, which need responsive plans for resilience and development. Overall, environmental management is a prerequisite for sustainable development.

### 1.2. Objectives of this strategy

One of the main objectives of this strategy is to inform the review of existing and crafting of future landuse, strategic, spatial and economic development strategic plans on the inclusion of a responsive and desired future when it comes to planning for sustainable development.

### 1.3. Understanding of the green economy in the context of South Africa

South Africa as a country is a signatory to the International Treaties including on sustainable development. The country also hosted an international summit on sustainable development in 2002, which came up with commitments, which needs to be met towards a sustainable future.

As starters, when discussing the ‘green economy’ it’s imperative to begin by unpacking the concept of sustainable development. Broadly speaking and in simple terms sustainable development can be explained as development, which meets the needs of today’s generations without jeopardizing the needs of future generations to also meet their needs, especially on utilizing the natural environment. The following diagram presents the pillars of sustainable development.

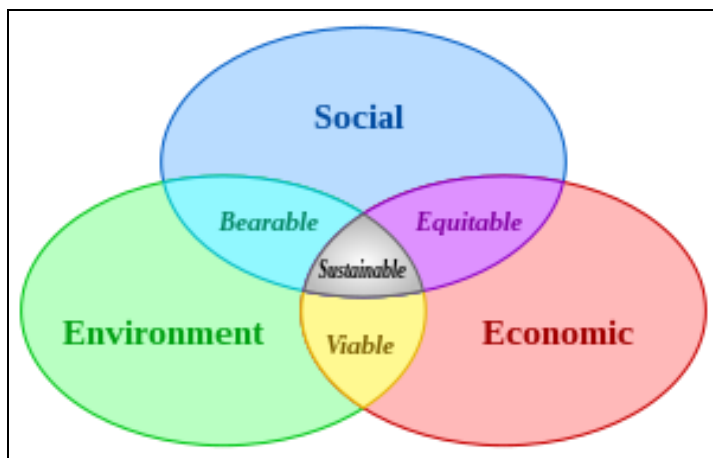


Figure 1 Pillars of the Green Economy in the broader context of sustainable development

Source: [https://en.wikipedia.org/wiki/Green\\_economy](https://en.wikipedia.org/wiki/Green_economy) , accessed on 16 May 2023

When the social, environmental, or ecological and economic aspects are well management they result in social equity thus reducing the levels of inequalities among communities, resilient areas, and economically viable development. In South Africa, the National Development Plan as a roadmap to the country's sustainable development path, identifies what has been known as the triple challenges of underdevelopment, inequalities, and poverty. There are numerous policies, strategies, and other implementing frameworks at national, provincial, and local government levels in place that seek to address the reduction of the negative impacts caused by the triple challenges. South Africa is known as one of the most unequal countries in the world, there are high levels of poverty and skewed development as a result of the apartheid system of the past.

Various pieces of legislation such as NEMA, WULA, SPLUMA and others as statutory instruments, are aimed at guiding implementation of sustainable development in South Africa. Specifically on the green economy, there is a national framework and guidelines. However, the mandate spreads across various national, provincial departments, local government and SOEs.

#### **1.4. Regional or District context**

The Harry Gwala District Municipality is no difference from the rest of the country as the same or similar challenges exist in the broader categories of poverty, inequalities, and underdevelopment. At the same time, the District is known for its richness in abundance of pristine natural resources. However, the available natural resources are threatened if they are not managed properly through sound environmental management. The following sector plans of the IDP exist and those, which are recommended:

- ❖ Environmental Management Framework (exist)
- ❖ Biodiversity Sector Plan (recommended by localizing the Provincial Conservation Plan / C-Plan)
- ❖ Climate Change Response Strategy (exist)
- ❖ Green Economy Strategy (this document)



**uMzimkhulu Local Municipality:** mainly rural homesteads (imizi in isiZulu), subsistence farming, commercial agriculture, the Umzimkhulu river, which cuts across the entire District becomes a dominant landmark. Grasslands and other sites of ecological importance exist.

Looking at the environment of the UMZ LM, detailed planning is encouraged for bulk solar energy generation, something like a 'solar farm'. Furthermore, exploration for wind energy generation.

Other green projects, like in partnership with DOS, Eskom on the installation of solar geysers.

**Dr Nkosazana Dlamini-Zuma Local Municipality:** sparsely populated farm and rural homesteads, traditional authority land under ITB, there is Ukhahlamba Drakensberg World Heritage Site, opportunities for nature-based or eco-tourism. There are also Ramsar Wetlands. The presence of Ntsikeni Nature Reserve is also strategic for expanding the green economy in this municipality.

At DRNDZ LM, detailed planning is encouraged for bulk solar energy generation, something like a 'solar farm'. Furthermore, exploration for wind energy generation.

Other green projects, like in partnership with DOS, Eskom on the installation of solar geysers.

**Greater Kokstad Local Municipality:** also playing a pivotal role in the gateway purpose of the District due to its proximity to the Eastern Cape and Ugu District. The smart city concept and some catalytic projects have been identified for implementation in this municipality. The municipality is endowed with significant ecosystems services that have the potential to stimulate the green economy.

Across the District, eco-tourism is earmarked as a game changer in the green economy. From the Drakensberg mountains down to the Mkhomazi valley, awaits the natural beauty to be appreciated by nature loving tourists (domestic and international). Eco-tourism value chain can create several opportunities ranging from accommodation, tour guiding and other services in the local economy.

From the HGDM's IDP on the green economy:

“The District will certainly capitalise on the opportunities of Green Economy as it is identified as a sustainable development path based on addressing the interdependence between economic growth, social protection, and natural ecosystem. The National approach is to ensure that green economy programmes are to be supported by practical and implementable action plan therefore importance of building on existing best processes, programmes, initiatives, and indigenous knowledge in key sectors “Towards a resource efficient, low carbon and pro-employment growth path” and that government alone cannot manage and fund a just transition to a green economy, that the private sector and civil society must play a fundamental role. The strategy under review (EGDS) will identify Green

economy opportunities and explore how to maximise those opportunities. The Agency, Provincial Environmental Affairs as well as the local municipalities will facilitate the implementation of sustainable waste management practices (waste beneficiation)” HGDM IDP: 2021-2027

In a nutshell, the green economy strategy looks at the following:

- ❖ Jobs in the green economy
- ❖ Skills for the green economy
- ❖ Catalytic projects for green economy
- ❖ Influencing budgets and fundraising for the green economy
- ❖ Green economy mainstreaming
- ❖ Alignment: globally: SDGs, nationally, provincially and at regional/local level

The strategic focus under: sustainability and resilience highlight the following pillars:

- Sustainable human settlements-in the value chain-like in the installation of solar panels (for lighting, cooking and solar geysers) in existing and new housing units.
- SMART infrastructure and technology: including use of appropriate technology, and Indigenous Knowledge Systems (IKS)
- Environmental sustainability: working for water, working for fire, groen/green deeds-, eco-tourism (community-based eco-tourism and training of tour guides, SOCS,
- Renewable energy (SMART energy): solar, wind, hydroelectricity and bio generation energy generating alternatives to fossil fuels burning.
- Disaster Management: preventative, responsive, mitigation-planning to delineate areas that are prone to disasters (flood lines, use of geo-tech surveys' reports).

### **Other Green Economy Initiatives within the Greater Kokstad Municipality**

1. The Municipality entered into partnership with the KZN Economic Development that resulted in Co-funding agreements to develop the Smart City Development Strategy which plans for a city that will have green environment, Green Energy and Smart Businesses etc.
2. The Municipality was then funded to implement a project emanating from the Strategy, a Legacy Project – Thuthukangele Hydroponic Tunnels and Kransdraai Tunnels were identified and have been converted from diesel generators and three phase electricity to solar panels, pumps, and boosters. The irrigation system for both the tunnels is now converted to green energy systems. R 1 million budget allocated.
3. The Municipality has partnered with Sustainable Energy Africa to develop strategies fused towards green energy initiative and energy efficiency. Through this partnership the Municipality has developed the Small-Scale Embedded Generation Photovoltaic Policy and Bylaw to regulate and encourage the use of less carbon emissions- Solar Panels/Farm and Wind.
4. The Municipality is currently in a process of procuring hectares of land for the purposes of establishing a Graeter Waaifontein Precinct Plan which will be



earmarked as the Green Economic Zone developments. The development plan is on the initial stages and the budget allocated is R 15 million.

5. The Municipality is sourcing funding through foreign direct investments, private /public partnerships to build a 7000MW Solar Farm. different private business has presented to Council their funding models and plans.
6. The municipality has adopted a small, embedded generation policy.
7. The municipality is currently rolling out the Energy efficiency generation programme funded by DMRE .

Climate change from the IDP 2021-2027

### **Climate and response to climate change**

The climate of Harry Gwala is influenced by the cool Drakensberg Mountains to the west. Temperatures vary with altitude, so in KZN we have a range from warm and humid conditions at sea level, contrasting with very hot and often dry in the bushveld, to very cold at 2000-3000 m above sea level in the Drakensberg. The highest rainfall areas are in the Drakensburg, in winter, spring and early summer most of the rain is caused by cold fronts, moving in from the south-west. These are often preceded by hot, desiccating, dry “Berg” winds from the north and north-west.

Snowfalls are common mainly in the Drakensberg, where snow usually melts within a few days, though heavy snowfalls can blanket the summit for weeks. Many species of plants are adapted to the harsh conditions and thrive in areas prone to frost and snow.

During this IDP process HGDM has noted the need to develop the Climate Response Strategy that will help in unpacking the impact of climate change within the District. (HGDM IDP 2021-2027)

There is a need to promote climate resilient agricultural practices by partnering with the Department of Agriculture.

### **Linkages With The Disaster Management Plan (IDP)**

According to the IDP, the Harry Gwala District Municipality is prone to different types of disasters such as Fires, Heavy rains and strong wind, floods, drought, snow, thunderstorms, and lightning.

- **Indicator no. 24** Increased waterborne and communicable diseases (e.g. Typhoid fever, Cholera, and hepatitis). The change in climate creates favourable conditions for water borne diseases and impacts on environment and personal hygiene.
- **Indicator no. 29 of Climate Change Response Plan:** The increased impacts on strategic infrastructure. Flood plain areas to be mapped and zoned accordingly. Submission of plans to disaster management, engagement of Traditional Leaders in allocation of land.
- **Indicator no. 31 of Climate Change Response Plan:** The isolation of rural communities due to soil erosion and road slippery as a result of heavy rains - Poor

road maintenance and construction of roads. The vulnerability of communities to climate change impact should not be determined by the location of their settlements, but also how their settlements are serviced, how effective and capable the municipality is and to what extent communities are able to cope with the impact of climate change. This indicates that municipalities where communities live have to be effective and well serviced in order to assist communities in their challenges to adapt and mitigate climate change.

- **Indicator no. 32 of CCRP:** The increase migration to urban and Peri-urban areas. The migration of people from rural settlements to urban and Peri-urban areas must be monitored and by relevant stakeholders such as Development Planning, Environmental Affairs, Human Settlements and Disaster Management to ensure avoidance of illegal occupation of land and fast track the housing backlog.
- **Indicator no. 36 of CCRP:** Decreased water quality in ecosystem due to floods and droughts. Protection of water sources to ensure infrastructure available enables the environment to retain water in the event of heavy rains and flooding.
- **Indicator no. 38 of CCRP:** The increased impacts of flooding from blocking storm water and sewer systems. Cleaning of storm water drainages and maintenance to ensure capacity of the flow of water due to weather patterns influenced by climate change. Upgrading of sewer pipes.

## **Risk Reduction Capacity**

The organizational structure for risk reduction within the municipality includes Disaster Management, the Disaster Management Advisory Forum, and the interdepartmental Disaster Management Committee and local municipalities. The total structure of the municipality, with every member of personnel and every resource is also committed to disaster risk reduction. On-going capacity building is conducted continuously to assure the availability of adequate capacity for risk reduction.

## **2. About green economy's abridged conceptual framework**

South Africa views green economy as a sustainable development path based on addressing the interdependence between economic growth, social protection, and natural ecosystem. The South African approach is to ensure that green economy programmes are to be supported by practical and implementable action plan therefore importance of building on existing best processes, programmes, initiatives, and indigenous knowledge in key sectors "Towards a resource efficient, low carbon and pro-employment growth path" and that government alone cannot manage and fund a just transition to a green economy, that the private sector and civil society must play a fundamental role.

The country's sustainable development vision is outlined in the National Framework for Sustainable Development (2008) as "South Africa aspires to be a sustainable, economically prosperous and self-reliant nation state that safeguards its democracy by meeting the fundamental human needs of its people, by managing its limited ecological resources responsibly for current and future generations, and by advancing efficient and effective integrated planning and governance through national, regional and global collaboration". (<https://www.dffe.gov.za/strategicissues/jobcreation>)

## **Green Economy | UNEP - UN Environment Programme**

In a green economy, growth in employment and income are driven by public and private investment into such economic activities, infrastructure and assets that allow reduced carbon emissions and pollution, enhanced energy and resource efficiency, and prevention of the loss of biodiversity and ecosystem services.

4 Rs for a green economy: Reduce, Reuse, Recycle, Repurpose

### **Which skill is required to create a sustainable green economy?**

Not limited to the following:

But in addition to responsibly managing the environment, skills in clean energy, sustainable finance, construction, technology, and urban planning will also be required for an effective and inclusive green transition.

What is the definition of Green Economy in South African context?

(Sometimes words green growth, low carbon development, sustainable development are used interchangeably with the concept of the green economy.)

A more formal definition can be regarded as a “system of economic activities related to the production, distribution and consumption of goods and services that result in improved human well-being over the long term, while not exposing future generations to significant environmental risks or ecological scarcities”. It implies the decoupling of resource use and environmental impacts from economic growth. It is characterized by substantially increased investment in green sectors, supported by enabling policy reforms. The Green Economy refers to two inter-linked developmental outcomes for the South African economy:

Growing economic activity (which leads to investment, jobs, and competitiveness) in the green industry sector.

A shift in the economy as a whole towards cleaner industries and sectors.

### **What are Green Jobs?**

Green Jobs is defined according to UNEP as work in:

Agricultural, manufacturing, research, and development, administrative, and service activities that contribute substantially to preserving or restoring environmental quality. Specifically, but not exclusively, this includes jobs that help to protect ecosystems and biodiversity; reduce energy, materials, and water consumption through high efficiency strategies; de-carbonise the economy; and minimise or altogether avoid generation of all forms of waste and pollution.

Greater efficiency in the use of energy, water, and materials is a core objective i.e. achieving the same economic output (and level of wellbeing) with far less material input.

Green Jobs span a wide array of skills, educational backgrounds, and occupational profiles. They occur in:

Research and development; professional fields such as engineering and architecture; project planning and management; auditing; administration, marketing, retail, and customer services; many traditional blue-collar areas such as plumbing or electrical wiring; science and academia, professional associations, and civil society organizations (advocacy and community organizations, etc.)

Also, green jobs exist not just in private business, but also in government offices (standard setting, policymaking, permitting, monitoring and enforcement, support programs, etc.),

Not all green jobs will be new ones. Some green jobs are easily identifiable - such as people employed in installing a solar panel or operating a wind turbine. Others, particularly in supplier industries, may be far less so. For instance, a particular piece of specialty steel may be used to manufacture a wind turbine tower without the steel company employees even being aware of that fact. Thus, some jobs come with a clear "green badge," whereas others - in traditional sectors of the economy - may not have an obvious green look and feel.

South Africa recognises that green economy action has a number of crosscutting roles and responsibilities. The implementation is significantly decentralised and includes private sector, civil society, and all levels of government. The nine key focus areas are identified in the green economy programmes that include:

- Green buildings and the built environment: programme include greening private and public buildings.
- Sustainable transport and infrastructure: programme include promoting non-motorised transport.
- Clean energy and energy efficiency: programme includes -
  - Expanding off-grid options in rural and urban
  - REFIT optimisation for large scale renewable and localisation and
  - Up-scaling Solar Water Heater rollout
- Resource conservation and management: programme includes -
  - National payments for ecosystem services
  - Up-scale "Working for" programmes.
  - Infrastructure resilience and ecosystems
  - Offset programme
  - Wildlife management
- Sustainable waste management practices: programme includes -
  - Waste beneficiation
  - Zero waste community programme for 500 000 households
- Agriculture, food production and forestry: programme includes integrated sustainable agricultural production.
- Water management: programme includes -
  - Water harvesting
  - Alternative technology for effluent management
  - Comprehensive municipal water metering (Demand side management)
  - Reduce water losses in agriculture, municipalities, and mining.
- Sustainable consumption and production: programme includes -

- Industry specific production methods
- Industrial production technology changes
- Environmental sustainability: programme includes -

**Ecological Infrastructure**

Our ecological infrastructure is nature’s equivalent of built infrastructure. It includes our mountain catchments, wetlands, and coastal dunes, and is increasingly being recognised for its importance to service delivery in both the rural and urban contexts.

**Green economy initiatives**

Good environmental management coupled with integrated development planning will allow us to build a low carbon economy that supports resilient ecosystems and economies. Healthy and intact ecosystems give us more options for responding to climate change, alleviating poverty, and building a green economy.

The jobs will not be created in isolation to the department’s mandate; hence the Working for Water, Working on Fire and the Environmental Protection and Infrastructure programmes, through their various sub-programmes, will also deliver environmental outputs such as:



Figure 2 Green economy aspects Source <https://www.dffe.gov.za/strategicissues/jobcreation>

**3. Policy context and strategic interventions**

From the SONA 2023 as pronounced by HE The President that the country needs to respond to the current energy crisis, which has escalated to a national disaster. Innovative

ways of energy generation are envisaged, especially through the means of clean or renewable energy sources. (hydro (water), bio, hydrogen, solar, wind, gas and nuclear)

**Food security and climate change (impacts, mitigation)**

The food security concept is defined by four dimensions (availability, accessibility, utilization, and stability) and is interrelated with the Sustainable Development Goals. In fact, food security is part of the SDGs (goal 2 for zero hunger). Nonetheless, the question is if the sustainability dimensions are adequately considered by the food security pillars. The scientific literature highlights some concerns about these interrelationships and proposes either a new pillar or considering other variables, namely those associated with climate change. In addition, the several relationships between food security and sustainability are complex and need further multidisciplinary assessments. Agricultural practices, alternative sources of food supply, and public policies are determinants for more sustainable food security. (UN, 2023)

**Waste management as an element of the green economy**

Waste management has been identified as one of the elements in the green economy if managed properly. In the District, affluent areas like Ixopo at Ubuhlebezwe, Greater Kokstad, Umzimkhulu where there are larger volumes of waste disposal, the municipality can be innovative to plan income generating projects around waste management. The smaller towns like Bulwer, Himeville and rural areas can also tap into the waste management for economic growth initiatives. As an example, the HGDM can learn from areas like Ethekwini Municipality who have implemented projects like waste to energy generation project. Furthermore, the SMMEs can benefit as “wastepreneurs” in reclamation and recycling in what has been known as a ‘circular economy’. As already mentioned in the policy context section of this strategic document that South Africa is experiencing a shortage in power supply, hence a demand for alternative sources of energy.

**STRATEGIC INTERVENTIONS, GOALS AND OBJECTIVES**

<b>STRATEGIC INTERVENTION 3</b>	<b>GOAL</b>	<b>OBJECTIVE</b>
<b>WELL MANAGED RESOURCES</b>	Effectively managing resources towards sustainability and resilience.	<ul style="list-style-type: none"> <li>· Promote and support green economy initiatives.</li> <li>· <b>Energy Generation / Renewable Energy, Green Buildings, Sustainable Transport, Water Management and Waste Management.</b></li> <li>· Adapt and mitigate climate change.</li> <li>· Promote the sustainable utilisation of natural resources and compliance with environmental legislation.</li> <li>· Manage pressure on environmental resources.</li> <li>· Protect high potential agricultural areas</li> </ul>

STRATEGIC INTERVENTION 3	GOAL	OBJECTIVE
<b>WELL MANAGED RESOURCES</b>	Effectively managing resources towards sustainability and resilience.	<ul style="list-style-type: none"> <li>· Promote and support green economy initiatives.</li> <li>· <b>Energy Generation / Renewable Energy</b>, Green Buildings, Sustainable Transport, Water Management and Waste Management.</li> <li>· Adapt and mitigate climate change.</li> <li>· Promote the sustainable utilisation of natural resources and compliance with environmental legislation.</li> <li>· Manage pressure on environmental resources.</li> <li>· Protect high potential agricultural areas</li> </ul>
STRATEGIC INTERVENTION 1	GOAL	OBJECTIVE
<b>REGIONAL RESILIENCE AND SPATIAL INTEGRATION</b>	Creating an attractive well-functioning municipality with strong regional linkages, that offers quality infrastructure, access to basic services and efficient planning	<ul style="list-style-type: none"> <li>· Promote the District as a vibrant <b>regional service centre, premium tertiary education hub</b> and affordable place to live.</li> <li>· Promote settlement and rural development through focussing on <b>nodal developments</b>.</li> <li>· Ensure efficient public <b>transport connections</b> to and from the broader region.</li> <li>· Ensure optimum basic services delivery by addressing infrastructure backlogs, maintenance, and extending access to basic services.</li> <li>· <b>Advance into the new digital era by creating integrated urban infrastructure towards creation of the SMART city concepts</b></li> </ul>
STRATEGIC INTERVENTION 2	GOAL	OBJECTIVE
<b>RESILIENT, DIVERSIFIED AND GROWING ECONOMY</b>	Strengthening the economy to be resilient and diversified by creating a conducive environment	<ul style="list-style-type: none"> <li>· Facilitate investment, growth to transform sectoral development.</li> <li>· Attract and sustain business and commercial opportunities by creating a conducive economic environment for the trade and finance sector.</li> </ul>

	for economic growth.	<ul style="list-style-type: none"> <li>Promote and support local economic development, and support SMME and Entrepreneurial Development.</li> <li><b>Enhance the Knowledge Economy.</b></li> </ul>
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## Current And Proposed Projects

### Biomass at Donny Brook as one of the current projects

Whilst noting that the strategy is forward-looking, the Donny Brook biomass project is being showcased as a catalyst so that it could be replicated to other LMs in the district and beyond. It also mentioned to indicate a measurable baseline that informs future planning. It is an example of bioenergy generation as a form of RE.

The HGDA has partnered with the EDTEA for the establishment of a Biomass Pyrolysis Plant at Donnybrook in the Dr Nkosazana Dlamini-Zuma Local Municipality. The project is a private investment initiative supported by the Agency through funding from EDTEA (R2million) The Agency has entered into a collaboration with the investment facilitator, Mining Community Development South Africa (MCD-SA) to improve the identified facility at Donnybrook of establishing a Biomass Pyrolysis facility. The project has been completed and handed over. Employment opportunities have been created through this project.

### Relevant catalytic project (s)

Project	Location	Project Detail	PGDP Goal that is contributed to	District Driver of Growth/Objectives	Time Frame	Responsibility
1. <b>RENEWABLE ENERGY / ENERGY EFFICIENCY</b>	Implementation of Green Economy methodologies	Goal 1: Inclusive Economic Growth Goal 3: Human and Community Development Goal 4: Strategic Infrastructure Goal 5: Environmental	Goal 4: Strategic Infrastructure	Radical Economic Transformation to realise inclusive growth. •Strategic Infrastructure responsive to socio-economic development •Public Private Partnershi	Medium to Long Term	GKM (Project Champion), DOE, SALGA, Provincial and National Treasury, FDI



Project	Location	Project Detail	PGDP Goal that is contributed to	District Driver of Growth/Objectives	Time Frame	Responsibility
		Sustainability Goal 6: Governance and Policy <b>SUB-PROJECTS</b> <ul style="list-style-type: none"> <li>• Energy Generation and Singisi Sub-Station (Partnership between GKM / HGDM for Hydropower)</li> <li>• Singisi Sub-Station</li> <li>• Solar Energy Farm</li> <li>• Hydropower – Kemsdale Dam under construction</li> <li>• Hydropower – Umzim</li> </ul>		ps / Cluster Development Green Economy		

Project	Location	Project Detail	PGDP Goal that is contributed to	District Driver of Growth/Objectives	Time Frame	Responsibility
		khulu River				

The abovementioned catalytic projects are in the process of being quantified and packaged into bankable business plans for funding. This also includes the Umkhomazi river proposed hydro power generation. More information on these initiatives can be obtained from the Eastern Seaboard development specialists’ studies. (Summarized in this strategic document in the next section “renewable energy in the Eastern Seaboard region”

**From the HGDA’s budget**

Green economy promotion	1,500,000.00
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In the 2023/2024 budget the HGDA has budgeted an amount of R1, 500 000 for implementing programmes on the green economy. The HGDA seek to leverage further fiunding through partnerships with relevant stakeholders.

**4. Renewable Energy in the Eastern Seaboard region**

NB. The following information looks at the potential of renewable energy in the 04 Districts in the Eastern Seaboard regional area, with specific emphasis on the HGDM. As already mentioned in the’ policy context’ section of this strategic document that South Africa is experiencing a shortage in power supply, hence a demand for alternative sources of energy, especially “green” or renewable energy. For many decades, the country has relied heavily on coal power stations owned by Eskom. The burning of coal is becoming unsustainable economically and ecologically. The burning of fossil fuels has been identified as one of the major contributors to adverse climate change in the world.

Renewable energy

Hydro energy power

- Hydro4Africa portal contains information about hydropower projects in Africa.
- Study area information shows 11 sites for potential hydropower - mostly in OR Tambo District Municipality
- Illustration of potential new hydropower excluding existing and decommissioned sites.

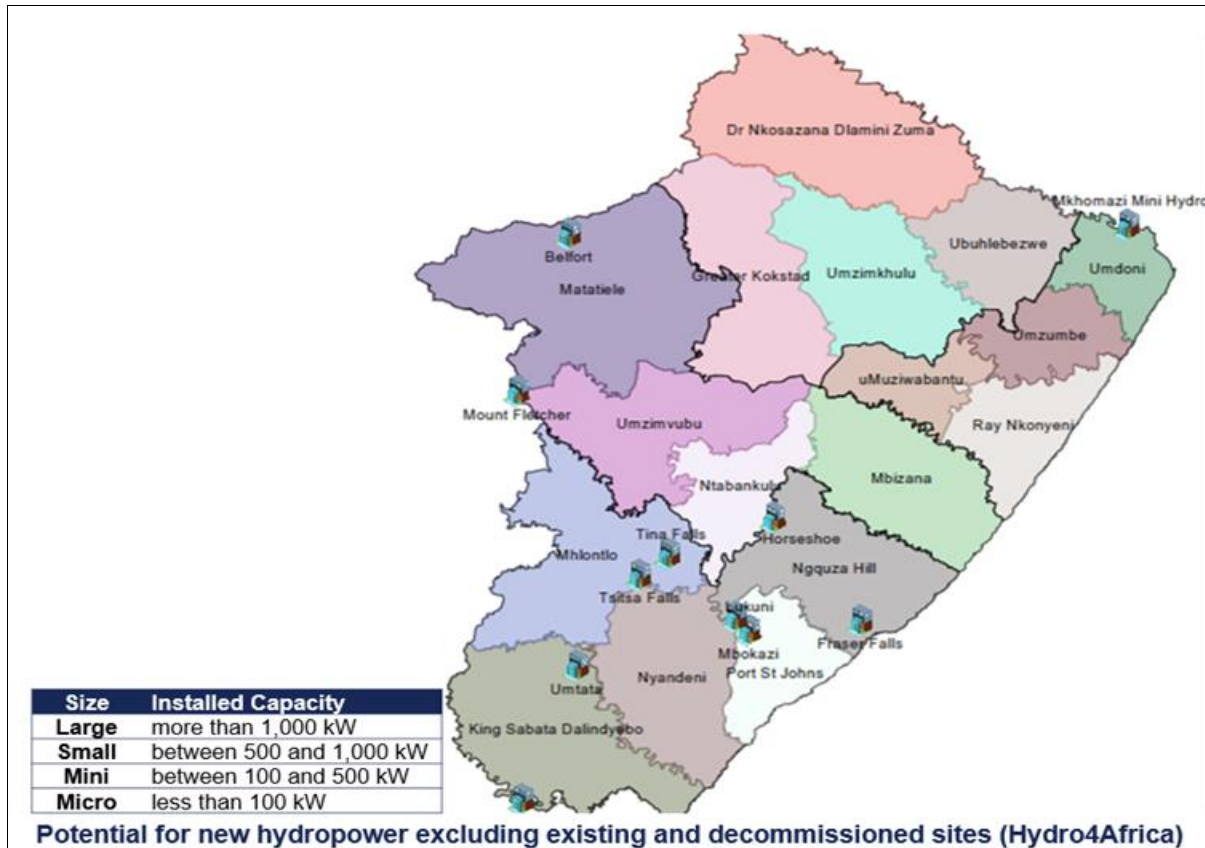


Figure 3 Potential hydropower sites, Source Eastern Seaboard Studies, 2023

The above map indicates the Mkhomazi mini hydro as one of the identified sites, which is within the HGDM area.

#### Regional master plan progress

There is a Master Plan being prepared under the umbrella of the Eastern Seaboard development that will result in the conceptual spatial layout and design, comprehensive infrastructure assessment and analysis report and a conceptual infrastructure investment plan.

### **BULK WATER AND SANITATION INFRASTRUCTURE REQUIREMENTS**

Water, Energy, Roads - identified as a critical and catalyst for the ESD project.

The ESD is a region with severe water access challenges for household consumption and for industrial/business use. The four districts, which are all Water Services Authorities (WSA) have presented their preliminary bulk water requirements which have been costed (estimates) and require funding. The following are the bulk water requirements per district: (comparatively)

- Alfred Nzo requires R10 228 000 000
- OR Tambo requires R19 406 250 000.00

❑ Harry Gwala requires R4 898 776 000.01

❑ Ugu requires R3 032 453 818

Total: Approximately R 37 billion (based on current demand and still to include future demand and developments)

A service provider has been appointed to do detailed project packaging and preparation of the projects for bankability and investment mobilisation from both the public and private sector.

- The project scope requires successful project preparedness and bankability of four projects from O.R. Tambo, Alfred Nzo, Ugu and Harry Gwala Districts, respectively.

### **SALGA initiatives**

What SALGA is doing in the implementation of the President's pronouncements on the green energy:

“President Cyril Ramaphosa has pronounced that Government was working to cut red tape for the registration of new power projects and announced plans to resuscitate Renewable Energy Independent Power Producers Procurement Programme to substantially increase investment in wind and solar power. While the President's plans lacked details on the role of municipalities in addressing the country's energy security, SALGA is forging ahead with its new generation capacity-building programme aimed at capacitating municipalities to be ready for the future energy landscape.” (SALGA, 2023)

According to its published information, SALGA is aiming at having up to 50% of municipalities ready to play in the space of IPPs, in the not-too-distant future. Notwithstanding, the financial constraints that municipalities are faced with, but those that are ready to procure energy from IPPs will be piloted.

### **From the Renewable Energy Master Plan of South Africa (2023)**

The Renewable Energy Master Plan of South Africa, can be summarized as follows:

Vision

“Industrialisation of the renewable energy value chain to enable inclusive participation in the energy transition, serving the needs of society, and contributing to economic revival.”

Key objectives by 2030:

- Grow the economy by fostering the rollout of renewable energy and battery storage projects,
- Grow the industrial capacity in the renewable energy and battery storage value chain,
- Create and sustain decent employment across the value chain,

- Build the capabilities needed for the industry,
- Build a transformed industry throughout the value chain,
- Contribute to a just energy transition

Furthermore, the Table below can be described as indicating the pillars of the RE Master Plan:

<b>Supporting demand</b>	<b>Driving industrial development</b>	<b>Fostering inclusive Development</b>	<b>Building the capabilities</b>
<ul style="list-style-type: none"> <li>•Market certainty</li> <li>•System readiness</li> </ul>	<ul style="list-style-type: none"> <li>• Localisation</li> <li>•Input materials</li> <li>•Trade promotion</li> </ul>	<ul style="list-style-type: none"> <li>•Transformation</li> <li>• New entrants</li> <li>• Just transition</li> </ul>	<ul style="list-style-type: none"> <li>•Skills and technology development</li> </ul>

The main “take aways” from the SAREM (2030) is to plan for an inclusive energy transition in its entire value chain, in South Africa by 2030. The value chain encompasses: RE generation, storage, distribution, operations and maintenance.

The following table depicts the possible renewable or green energy implementation areas in the Eastern Seaboard region (the four districts). The 1<sup>st</sup> phase of the study focused on identifying potential renewable sources in the region, and the following is a summary of the study: (according to MISA)

- On-shore wind energy – In all four districts
- Off-shore wind energy - King Sabata Dalindyebo LM, Nyandeni LM, Port St Johns LM, Ngquza Hill LM, Mbizana LM, Ray Nkonyeni LM, Umzumbe LM, Umdoni local LM
- Solar energy – In all four districts
- Bioenergy – In all four districts and prevalent in OR Tambo and Alfred Nzo
- Hydro energy – In 3 districts: OR Tambo, Alfred Nzo and Ugu

*Note: going forward, other sources of energy such as nuclear energy, oil and gas are being explored, in collaboration with DMRE*

Table 1 System types, sources, and types of renewable energy in the ESD

<b>System Type</b>	<b>Source</b>	<b>Types</b>
<b>BIOENERGY</b>	Source of energy in the form of solid, liquid and gas where such form of energy is derived from organic material known as biomass	<ul style="list-style-type: none"> <li>• Sources from plants (corn, sugarcane), wood, agricultural wastes, and bagasse</li> </ul>
<b>SOLAR SYSTEM</b>	The process of converting energy from the sun into electricity using solar panels.	<ul style="list-style-type: none"> <li>• Solar PV system</li> <li>• Concentrated Solar Power (CSP)</li> </ul>
<b>WIND ENERGY</b>	Process by which the wind is used to generate mechanical power or electricity	<ul style="list-style-type: none"> <li>• Onshore</li> <li>• Offshore</li> </ul>
<b>HYDRO POWER</b>	Energy that generates power by using a dam or diversion structure to alter the natural flow of a river or other body of water.	<ul style="list-style-type: none"> <li>• Run-of-river (RoR)</li> <li>• Storage (reservoir-based)</li> <li>• Pumped storage hydro</li> <li>• In stream (hydrokinetic)</li> </ul>
<b>TIDAL POWER</b>	Energy generated by surge of ocean water during the rise and fall of tides.	<ul style="list-style-type: none"> <li>• Single ebb-cycle system,</li> <li>• Single tide-cycle system and</li> <li>• Double cycle system</li> </ul>

Source: MISA, 2023

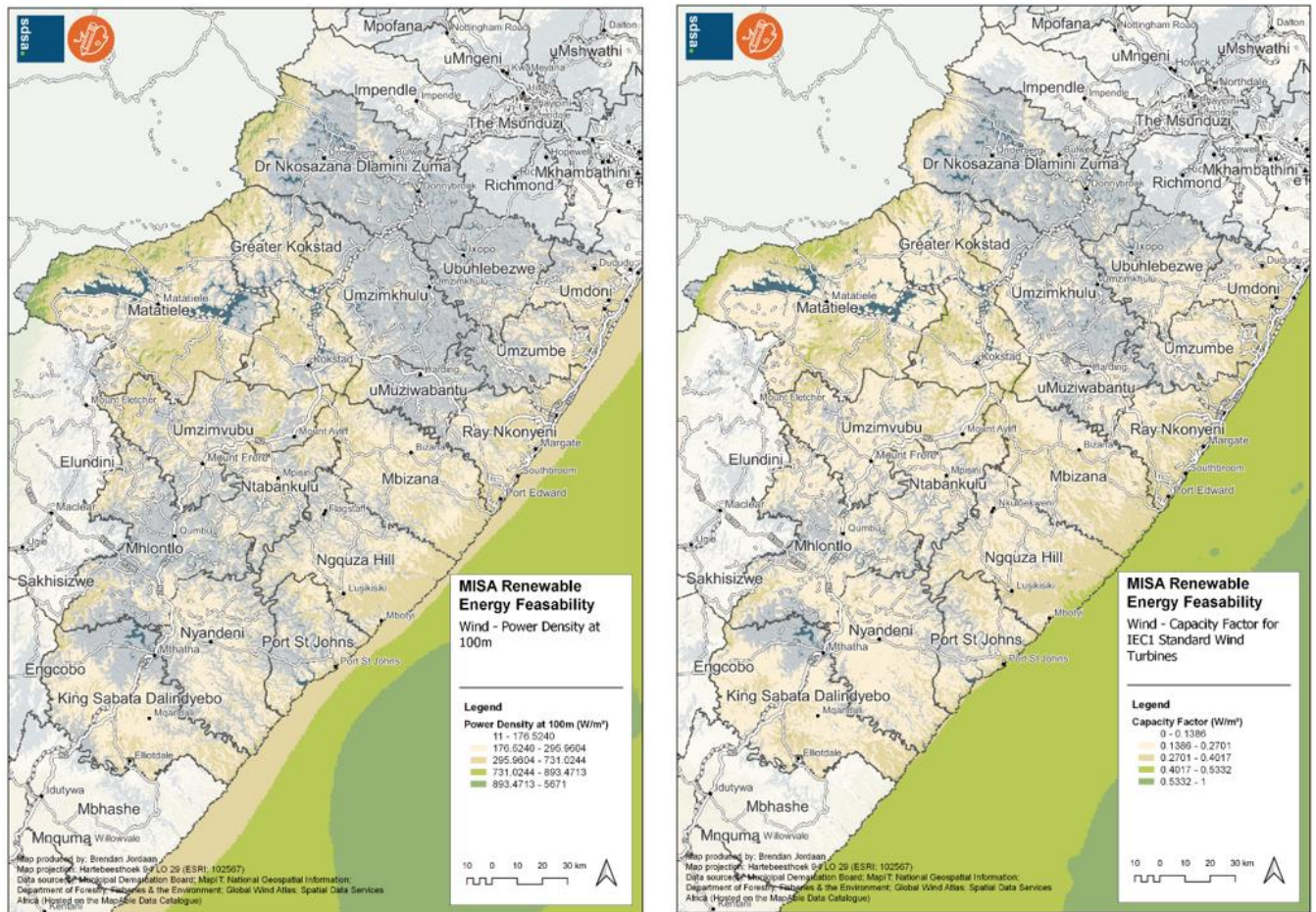
#### Eastern Seaboard Onshore Wind:

- Wind Energy
- Wind power density above 250 W/m<sup>2</sup>.
- High wind density directly proportional to wind capacity factor
- The following Local Municipality have Wind density above 250 W/m<sup>2</sup> Matatiele, Greater Kokstad, Umzimbuvu, Mbizana, Nquza Hill, Ray Nkonyeni, Umzumbe, Ntabankulu and Umdoni.
- The following local municipalities have poor wind power density (density below 250 W/m<sup>2</sup>) Dr Nkosazana Dlamini Zuma, Ubuhlebezwe, Umzimkhulu and uMuziwabantu.

The detailed feasibility studies are still being conducted on the renewable energy sources and areas within the ESD region. As already mentioned in this strategic document that the HGDA together with the LMs, MISA, the private sector and other stakeholders are in the process of packaging and planning around the catalytic projects and the green economy. Initiatives are a top priority.

The following spatial representation indicates the potential areas within the ESD regions specifically for wind energy generation: -

CONT.



**Wind Power Density**

**Wind Capacity Factor**

Figure 4 Renewable energy feasibility (wind) areas, Source MISA, 2023

### Bio-Energy

Bioenergy options which are feasible within each region are based on Department of Science and Innovation and implemented by the South African Environmental Observation Network (SAEON). Screening tool.

The screening tool shows potential within district municipalities for Bioenergy processes which require additional subsidy and processes which does not require subsidy for implementation.

Highest effective generation in ascending order per DM is OR Tambo, Alfred Nzo, Harry Gwala, and Ugu DM. Within Alfred Nzo DM.

Matatiele, KSD, Umuziwabantu and Greater Kokstad local municipalities, all with distribution licences, have high effective generation potential.



Table 2 alternative energy generation potential per LM within the HGDM

District (DM)	Municipality	Total Generation Potential DM (in MW)	Effective Potential for (LM)	Municipality	Total Generation Potential for LM (in MW)
Harry Gwala		767	Dr Nkosazana Dlamini Zuma		6
			Greater Kokstad		725
			Ubuhlebezwe		34
			Umzimkhulu		2

Source: Eastern Seaboard Development Studies, (MISA) 2023

### **Towards localization of the Eastern Seaboard Development Renewable Energy Feasibility Study**

Firstly, the study as commissioned by MISA in 2023, does indicate the potential in terms of what kinds and where renewable energy projects could be implemented, however it has limited information. The limitations are on details that are necessary to guide the potential investors to the districts. The study mentions that the projects are estimated to cost over R247 billion (in all the 04 districts), however it does not give estimated costs for the identified individual projects. A second tier of planning will be on development of concept documents and business plans for the projects. Broadly speaking the renewable energy projects can in:

- ❖ Solar PV
- ❖ Wind
- ❖ Geothermal, and
- ❖ Bioenergy.

The study looked at feasible options on all the above in the study area, which includes the Harry Gwala District.

### **Onshore Wind**

The renewable energy feasibility study indicates that within the ESD area, it is the GKM that has the potential for wind energy generation where a standard of 250W/m<sup>2</sup> is used.

NB. In simple terms the difference between off-shore and onshore wind is that the former means at sea and the latter means on land-away from the sea, which is relevant to the HGDM since we are not a coastal municipality.

The study mentions that there are conditions that determine the feasibility of onshore wind energy generation like soil types, the yields, climatic conditions and that there is an Atlas, which has been developed to guide planners and implementers.

## Solar PV

“Solar energy projects should consider a minimum Direct Normal Irradiation (DNI) of 200 kWh/m<sup>2</sup>/yr. The entire study area surpasses this requirement, with DNI ranging from 1,500 to 2,400 kWh/m<sup>2</sup>/yr.” (MISA 2023) So it is an enabling natural phenomenon that the entire ESD area has more than the required potential for solar pv as a renewable energy alternative.

The following image depicts the irradiation potential of South Africa:

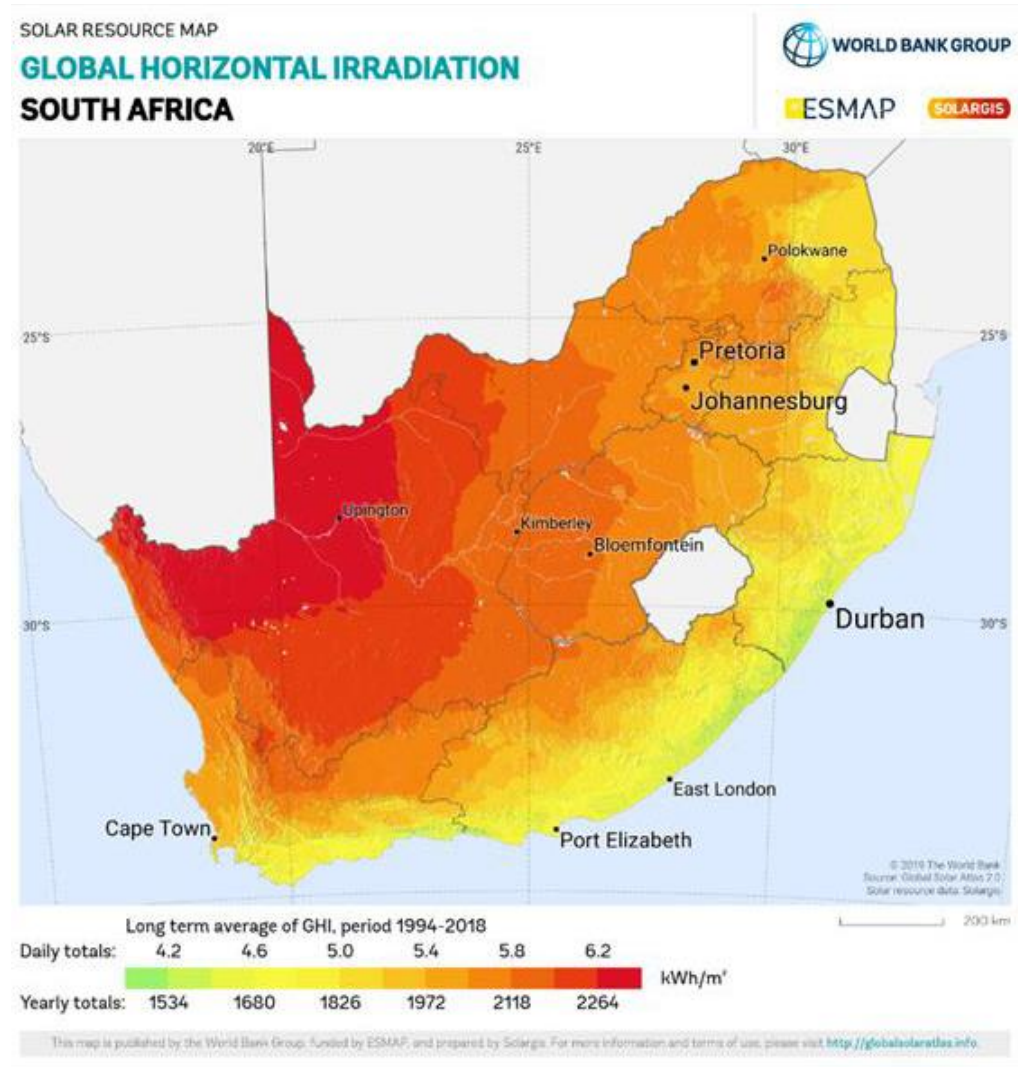


Figure 5 Irradiation map of SA as copied from MISA (2023)

From the above map, the ESD area depicts the “yellow” colours indication an above average capacity range of between 1680-1826 kWh/m<sup>2</sup>. Whilst taking into consideration that the study says that “a minimum capacity of 10 MW is recommended for potential solar energy projects in the study area”, however it does not give technical details on how this is measured.

## **Hydropower**

The study points out that that the main potential for this alternative is mainly identified at the OR Tambo District due to the rivers that flow outward to the sea. It does mention that there are other areas within the study area that may have potential. In the HGDM, it is the Mkhomazi river and the Umzimkhulu river that have been identified by the municipalities as potential sites for hydropower generation.

## **Bioenergy**

The feasibility study highlights the GKM as feasible for bioenergy generation. As already mentioned, one of the catalytic projects in the HGDM located that DRNDZ LM is the Donny Brook biomass project although it is not mentioned in the report, it is this particular project that currently serves as a catalyst in the HGDM.

## **Geothermal**

Heat from rocks, the reports says very little about this option.

Electrical network integration

Where renewable energy alternatives are added to or integrated with the current grid. This necessitated an assessment of the current electricity grid system, where the findings indicate that the integration could create problems.

## **Business case of renewable energy potential projects**

The determining aspects on whether the potential projects make business sense or their profitable viability? is twofold (especially from the private investor's perspective):

- ❖ Input costs, would there be a return on investment?
- ❖ The above question can be answered by exploring various variables like the tariffs structures.
- ❖ The role of municipalities-who will drive the process?
- ❖ What viable models are applicable? Would it be public private partnerships between municipalities and the private investors?
- ❖ Would the projects work as completely off grid or contributing to the current grid managed by Eskom?

All the above sub-questions determine the feasibility. The study has only flagged these issues; however it does not go into details on them. Now the next step is for municipalities to undertake detailed planning on:

- Sites suitability for the appropriate type of RE (wind, PV solar, bioenergy, hydropower)- or a mix
- Detailed costing
- Drill further on costings involved.
- Environmental studies

### **Recommendations for renewable energy implementation**

It is recommended that municipalities with the assistance of MISA and other Government organs embark on the requisite next steps from the RE feasibility study completed in July 2023. The next steps being the detailed planning as outlined above. Fundraising and budgeting is therefore required.

### **Working for water programme jobs in the HGDM**

In May 2023 the M.E.C. for EDTEA announced jobs for the youth in the working for water program, to be implemented in all the four Local Municipalities.

### **Identified partnerships.**

The entire District Family is encouraged to enter into strategic partnerships with potential role players in the green economy space both in the private and public sector. The following potential partners, however, the list is not exhaustive:

- ❖ Public: SANBI, DBSA, Department of Environmental Affairs, EDTEA, EKZW
- ❖ Private: GTZ, Energy South Africa

SANBI implements the “green deeds” programme.

Government, implements the Working for Water, Working on Fire and the Environmental Protection and Infrastructure programmes, through their various sub-programmes, such as

- ❖ rehabilitating of wetlands
- ❖ cleaning
- ❖ planting trees
- ❖ building of waste buy-back centres
- ❖ removing invasive alien plants, provision of infrastructure to facilitate conservation and rehabilitating thousands of hectares of land.

The jobs created will be coupled with skills development where accredited training person days will be achieved.

### **Conclusion**

This strategic document is high-level in nature, since most of the “green economy” initiatives are still at infancy stages of identification. Once the projects have matured into detailed planning and implementation -a clear implementation, monitoring and evaluation tool will be developed over and above the annual SDBIPs. All Local Municipalities in the District Family are encouraged to conceptualize, package / plan and implement the projects categorized as part of the green economy. And to fundraise and budget for the identified projects.

Therefore, this strategic document becomes a guideline for implementers both public and private. Independent power producers (IPPs) are encouraged to invest in the HGDM area. And to partner with local SMMEs and businesses in the generation of renewable energy.

## **Acknowledgements**

HGDM (2023), IDP 2021-2027

HGDM (2023), DDM

HGDA-Biomass Closeout Report

[https://en.wikipedia.org/wiki/Green\\_economy](https://en.wikipedia.org/wiki/Green_economy) , accessed on 16 May 2023

<https://www.dffe.gov.za/strategicissues/jobcreation>)

UNEP - UN Environment Programme

Eastern Seaboard – Regional Spatial Development Framework

## ANNEXURE

The Concept plan on the Green Economy of the HGDM