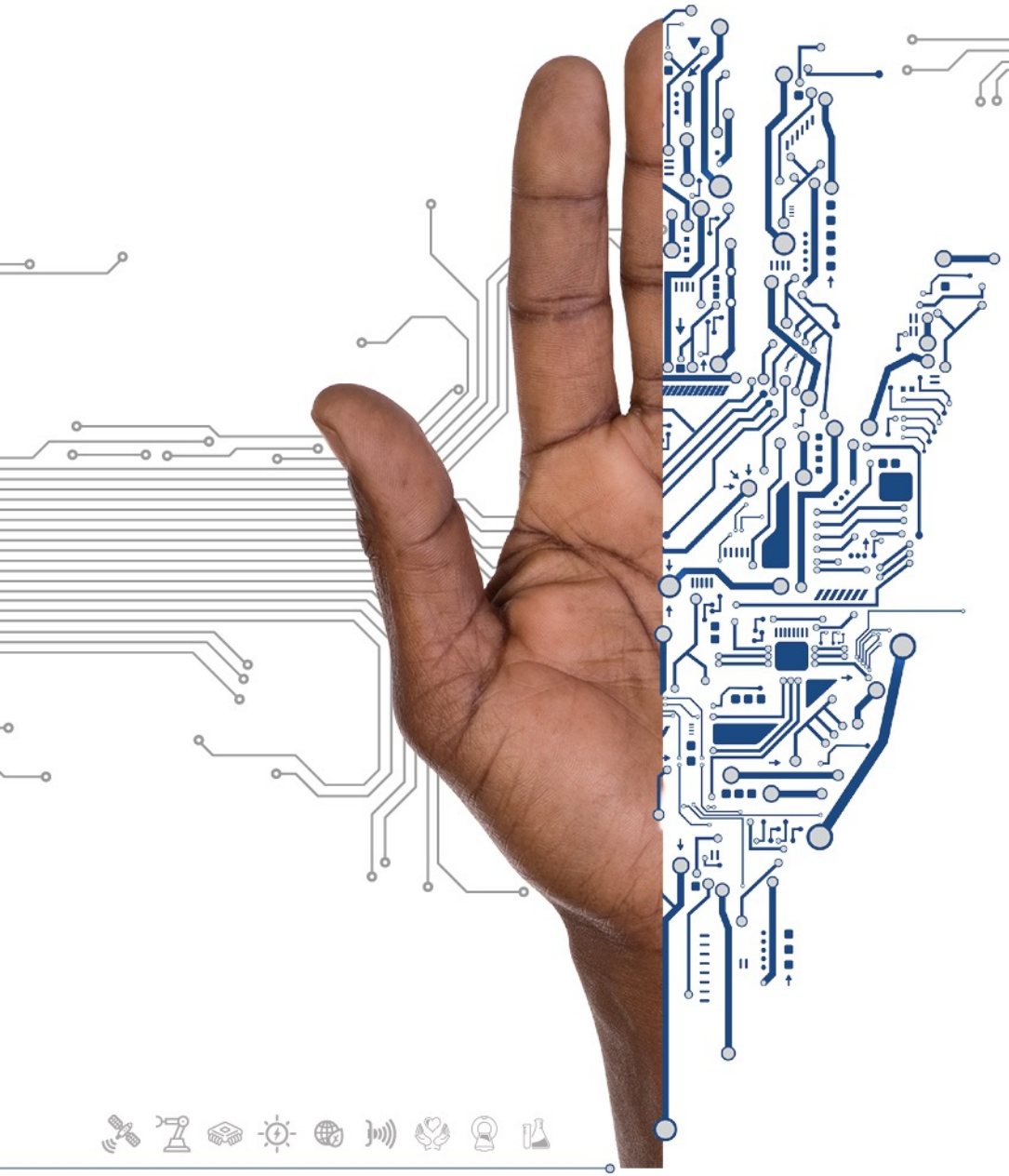

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Energy/ Natural Resources

2023/2024

science & innovation
Department:
Science and Innovation
REPUBLIC OF SOUTH AFRICA

Mandate

Technology Innovation Agency

- The mandate of TIA is derived from the provisions of the Technology Innovation Act (Act 26 of 2008), which establishes TIA as an Agency to promote the development and exploitation, in the public interest, of discoveries, inventions, innovations and improvements.

- The objective of TIA is to support the State, through the DSI, in stimulating and intensifying technological innovation in order to improve economic growth and the quality of life of all South Africans by developing and exploiting technological innovations.

Purpose of Natural / Energy Resources BU

- The Natural Resources business unit strategic focus areas are water resources management, waste management (circular economy, environment), climate change, mining and minerals processing.
- Energy – low carbon economy, e-mobility, hydrogen, net-zero

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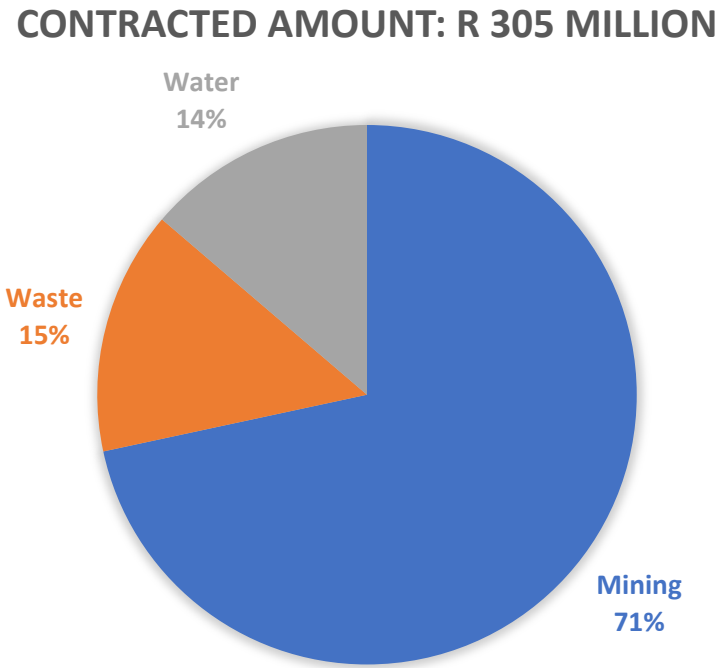
Natural Resources Total Disbursements



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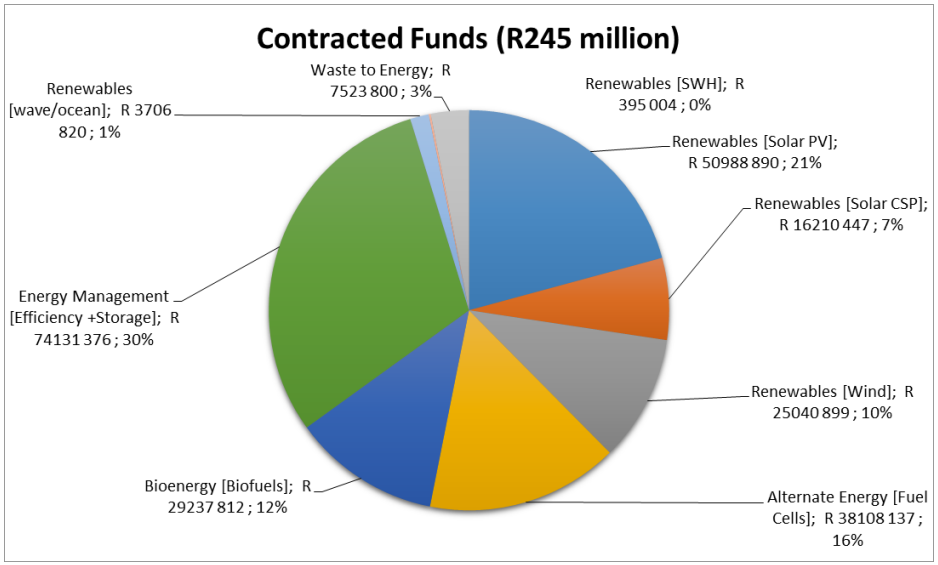
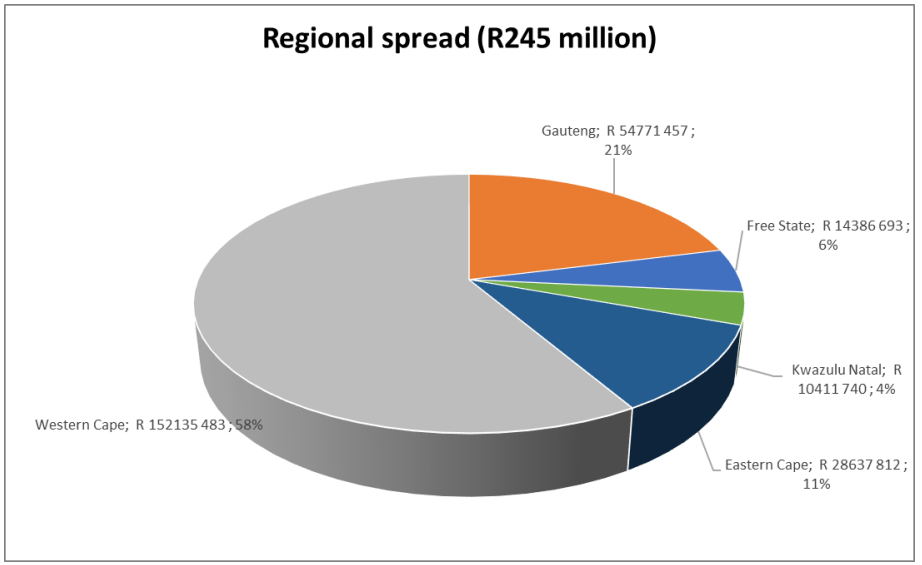
PORTFOLIO ANALYSIS





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- **Decadal plans focus areas**:
- Sector: Green Economy
- Sector: Mining and mineral beneficiation
- Sector: Water, waste and circular economy

- **Supporting priorities**:
- Beneficiation
- Service Delivery
- Circular Economy
- Economic Transformation and Job Creation

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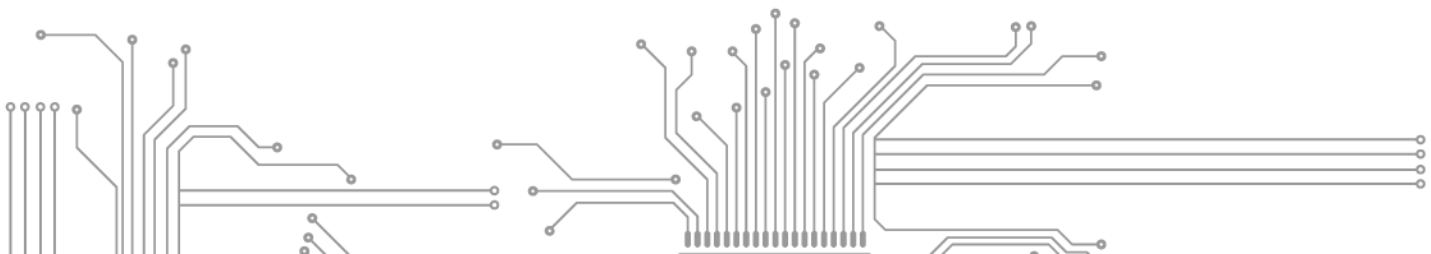
- Energy
- Resilient energy technologies
- Low carbon economy
- Battery Storage
- E-mobility
- Presidential Climate Commission
- Net Zero
- Renewables
- Hydrogen



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Situational Analysis water

There's nothing more essential to life on earth than water. Yet, from Cape Town to Flint, Michigan, and from rural, sub-Saharan Africa to Asia's teeming megacities, there's a global water crisis. People are struggling to access the quantity and quality of water they need for drinking, cooking, bathing, handwashing, and growing their food.

South Africa receives an annual rainfall of 492 millimeters whereas the rest of the earth receives 985 millimeters. This is nearly half the earth's average thus, South Africa is classified as a water-stressed country, with these huge constraints municipalities still lose one third water production in South Africa a year through leaks and unpaid water bills (revenue loss of R9 billion per year), Surveys also show that households lose 30% of water by leaking toilet cisterns.

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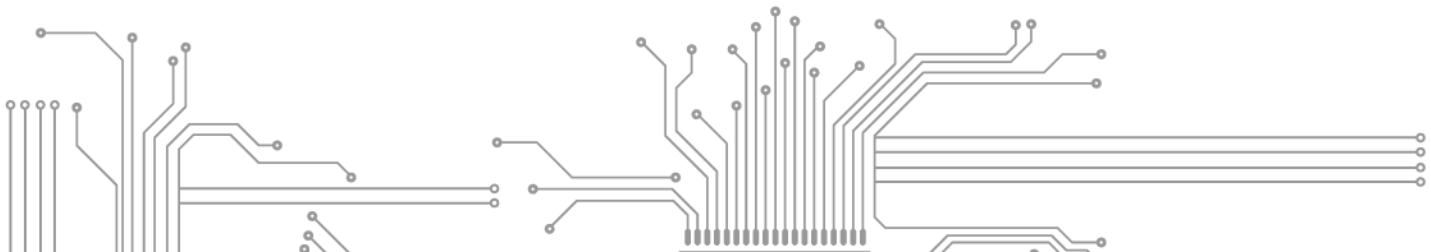
TIA Water and Sanitation Strategy

- Supporting technologies that ensure water security
- Reducing water leaks at Municipalities
- Supporting water technologies in the Mining industry which the backbone of the economy
- Digitization of technologies
- IoT, AI, Machine learning in water sectors



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Water Security projects

Project/programme name	Project/programme description	Current TRL level	Investee type*	Investee demo-graphics**	District/metro municipality & province	Total funding approved	2022/23 budget
Water Security, water saving devices, sanitation, water technologies							
Demonstration of a Biological Process for the treatment of Acid Mine Drainage (AMD)	The technology is a passive Acid mine drainage solution that uses bacteria that can be harvested from wood chips and cow dung.	TRL6	SC	Various,	Gauteng	R10 665 100	R1 035 504
EDC Tanks	An aesthetically appealing rain water harvesting system that uses a device called the rain distribution module that enables the use of municipality water and the rain harvested water for toilet flushing purposes	TRL5	SMME, EDC Tanks	Male: Indian	EThekwini, Durban KZN	R2 003 945 from TIA and R2 496 521 from the WRC	R1 767 147
A system for production of super oxygenated water	A system, comprising generation/ concentration of oxygen from air, converting it to ozone and dissolving it water and converting back to and retaining in water for hydroponics plant growing purposes.	TRL4	SMME	Male: White, Male: Coloured	EThekwini, Durban KZN	R2 947 606	R1 844 400
The VulAmanz Water Purification Microfilter (VM) - A Green Engineering Technology Platform for Decentralised Water Treatment and Reuse	The purpose of this project is to demonstrate the three applications of the VM technology (i.e. the rural water filter, the pool waste water treatment filter and the pretreatment filter), in varying environmental conditions	TRL4	Independent Inventor/ SMME	Male: White Male: Indian	Stellenbosch, Western Cape	R10 217 909	R941 859

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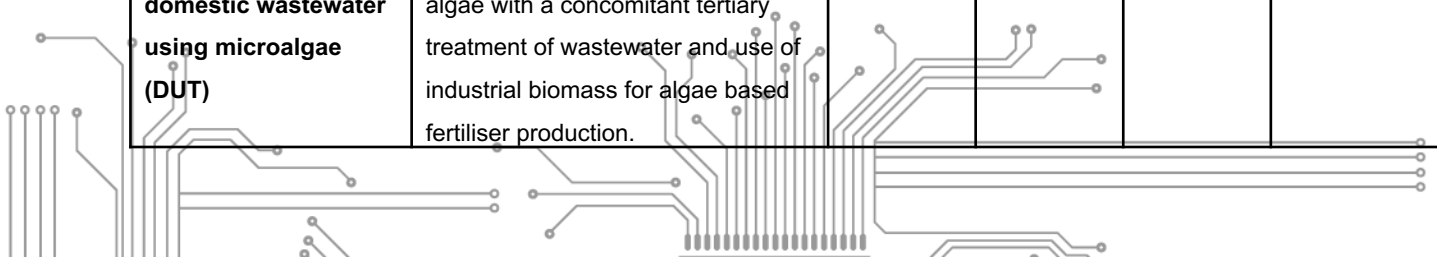
Water and Sanitation Projects

WHC PreCommercialisation	The aim of the is a demonstrated technology that is ready to be commercialised and which has completed all of Massmart's requirements in order to unlock both commercial production and uptake into Massmart's and other distribution channels supply chain	TRL7	SMME	Male: African	Gauteng	R2 306 724	R1 103 112
Water and Sanitation Fault Management System	The purpose of the project was to develop and test an app system that could be used by Municipalities to monitor and manage water and sanitation faults in order to significantly impact water loss as well as improve responses to a variety of other water and sanitation faults.	TRL4	SMME	Male: White Male: Black	Glenwood, Durban	R 2 396 538	R2 253 248
Tertiary treatment and beneficiation of domestic wastewater using microalgae (DUT)	To develop a technology package for the production of bio-oil from algae with a concomitant tertiary treatment of wastewater and use of industrial biomass for algae based fertiliser production.	TRL5	HEI	Various	Durban	R14 113 906	R448 461



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Successes

- Municipal water leaks – R40m from eThekwini Municipality – project implement COJ, CPT, Zululand, Newcastle. New IF funding to implement in all Metros in SA and at 10 more Municipalities.
- AMD – Collaboration between Mintek (R5m), Thungela (Anglo Coal) (R17m), TIA (R10m) and University of Pretoria .
- Part of Water RDI Steering committee
- Presidency SAFE program
- Trailblazer – interest from Mining houses
- Vulamanz – implement technology in PE, Buffalo City, East London, Ugu, Zululand

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- Digitisation of Technologies project
- Trailblazer Technologies– international exposure
- UK Innovate – Collaboration
- Rotowinner – water technology – electrolysis of water
- Mondia – new digitization

Mining and Mineral Processing

- Numerous industries worldwide depend on the supply of mineral commodities from underground. The dependency of various high-tech-industries on rare earths is a recent issue – coal, on the other hand, is still one of the leading global energy resources. Consequently, the mining sector is pivotal to the world's economy.
- South Africa's total mining reserves remain some of the world's most valuable, with an estimated worth of R37.3-trillion ($2.5-trillion), but most South Africans do not benefit from these resources

Successes - Mining

- Grew Stone Three from R8m-R49m-R59m-R100m
- Received royalty R117 000- R770 000- R1,4m
- Stone Three has began to pay it's Innovation Funding
- AIT: Received about R8m in royalty payments
- Blue Cube: They are currently paying off a R2m royalty, the current year Royalty is R1,2m.
- Trailblazer- signed a licence to Nefasi water – R120m plant
- Trailblazer: Project – New Mexico, sign R1m agreement with Sibanye to implement project throughout SA.

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