



technology innovation
A G E N C Y
Innovating Tomorrow Together

Energy Annual Operation Plan 2023/24



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



STRATEGIC FOCUS AREAS

➤ **Hydrogen Economy**

- Fuel cells
- PGMs
- Green/blue/grey Hydrogen

➤ **To identify technologies that will combat the immediate effects of loadshedding on businesses, schools, and communities.**

- Residential areas – micro grids, smart grids, energy management systems, and affordable technologies.
- Small businesses – affordable technologies: energy efficiencies, energy storage, generators, solar panel, and invertors.
- Communities – mobile smart grids, energy management systems, solar panel, and invertors.

➤ **Just Energy Transition**

- Engagements with the Presidential Climate Finance Task Team to support TIA initiatives relating to energy innovation and climate change.
- Low carbon economy
- Skills development

STRATEGIC FOCUS AREAS

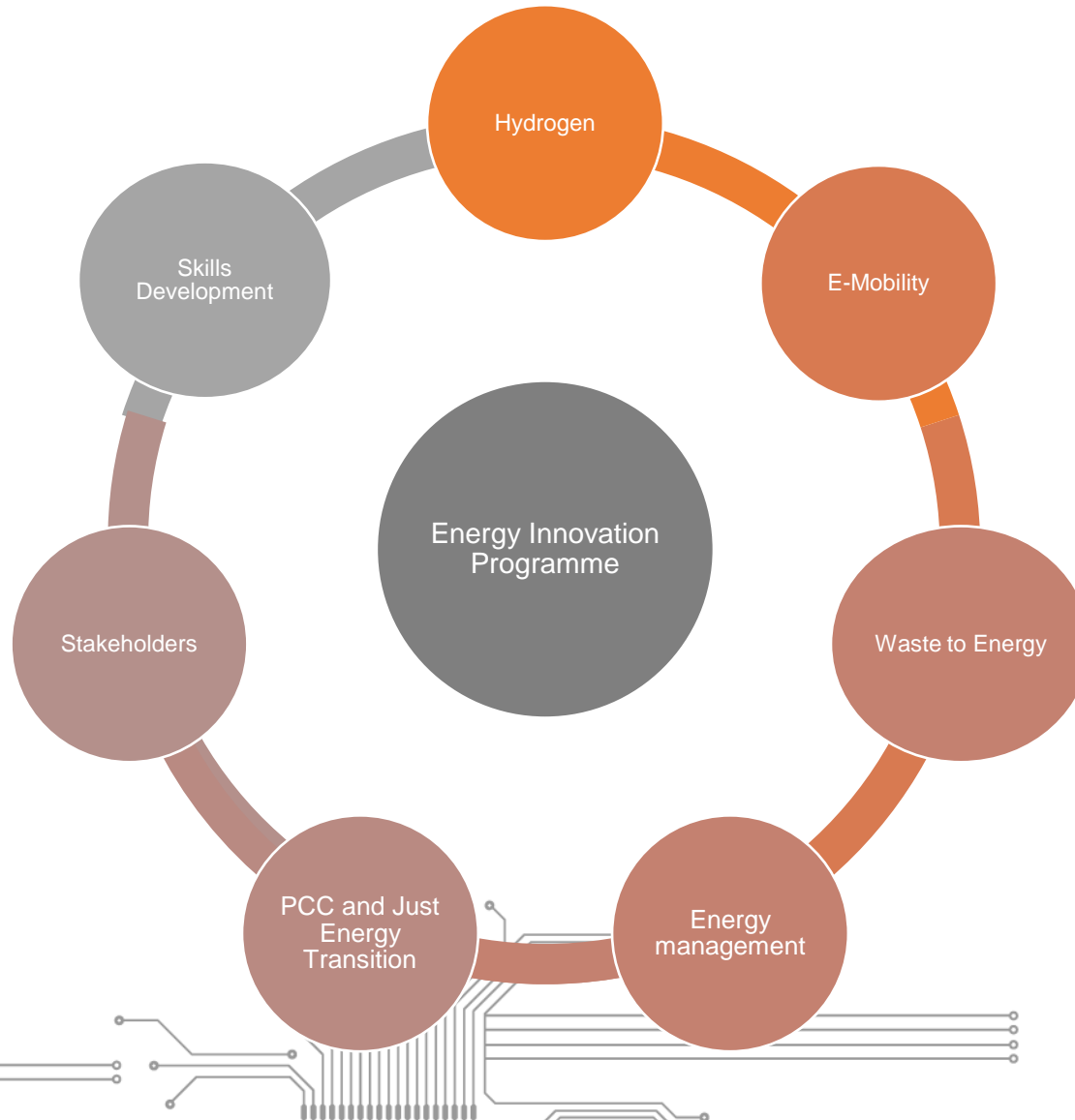
➤ Energy Storage

- Lithium-ion batteries
- Fuel cells
- Mechanical storage e.g compressed air energy storage

➤ E-Mobility

- Through the uYilo eMobility Programme, the Energy BU will continue partnering and collaborating with the private sector (e.g. Original Equipment Manufacturers such as Nissan, BMW and VW) with regards to promoting the uptake of electric vehicles (EVs) and relevant research in battery storage technologies. The public sector (e.g. DoT and the DFFE) will also be engaged on policy-related issues.
- Internationally, the uYilo eMobility Programme will continue its partnerships and collaborations with the likes of UNIDO, particularly in relation to low carbon economy and EVs.

Energy Innovation Program



ENERGY

- **HELIO 100**

- Helio100 is a heliostat project developed by the University of Stellenbosch with financial support from the DSI and investment by TIA. The aim of the project is to develop a low-cost heliostat with high optical accuracy, which can be used in a Concentrated Solar Power (CSP) plant. The outcome of the project is to support the development of an independently verified pilot plant that is tested to demonstrate successful operation.



ENERGY

Brayfoil Technologies

Brayfoil Technologies (Pty) Ltd has been funded by TIA to develop new self-adjusting wind turbine blade technology that allows for longer, more effective blades. This is achieved by actively changing the shape of the blade in response to the wind conditions, preventing overloading and increasing outputs for large onshore and offshore wind turbines. Based on studying nature – how the wings of the Cape Vulture change shape – they have developed a simple, patented solution that can increase turbine outputs up to 25%. The shape changing technology takes advantage of existing industry materials and processes, allowing for recyclable blades in the future. Their first demonstrator turbine is under construction near Stellenbosch.

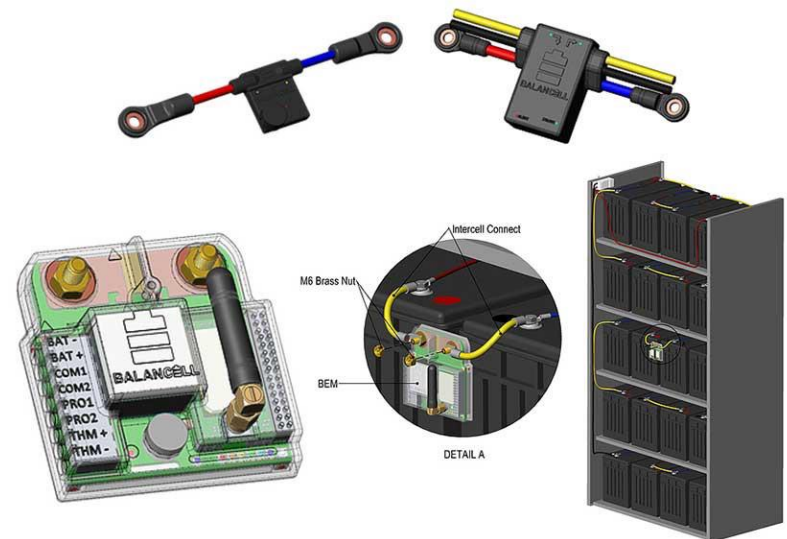


ENERGY

- **Balancell**

- Battery life span is dependent on the correct use and maintenance of each unit to ensure equal charging and discharge during everyday use..

- TIA has invested in Balancell (Pty) Ltd to provide battery management systems for industrial use mainly targeted at the forklift and telecommunications battery market. Balancell has since developed an on-board battery management solution achieving cell balancing across the system or battery pack installation. The Battery Energy Meter (BEM) coordinates the Battery Management System and feeds data to a database and user interface providing real time data on the status of the batteries and their usage. The battery energy meter, through its increased functionality, can measure and upload (via a GSM link) a range of individual cell parameters for storage in cloud-based databases



Commercial Success

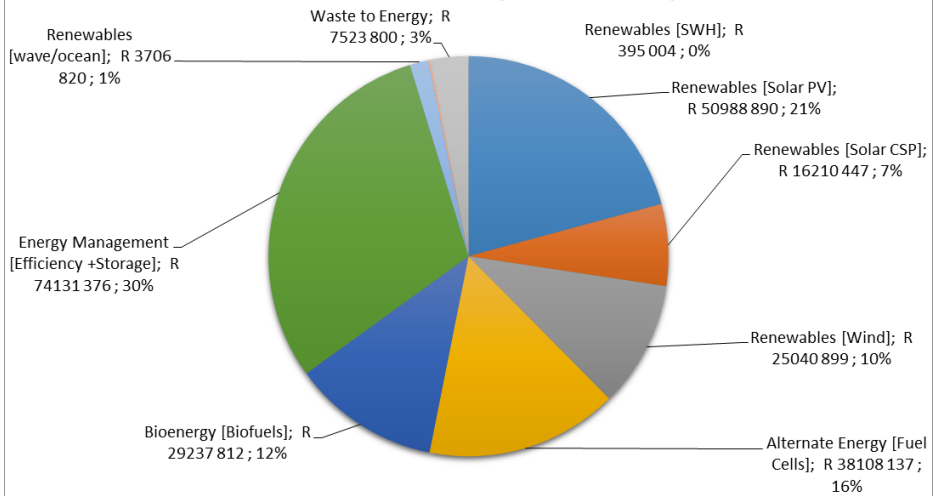
- uYilo program – major success – only battery certification facility in South Africa.
- Kickstart fund projects – Golden Arrow Bus charging infra structure
- Balancell success
- Solzen – ultra capacitor to possibly commercial
- SAMAC – Mobile air conditioner
- CAES – signed licensed with Australian company – FY21

ENERGY BUSINESS UNIT - PORTFOLIO ANALYSIS

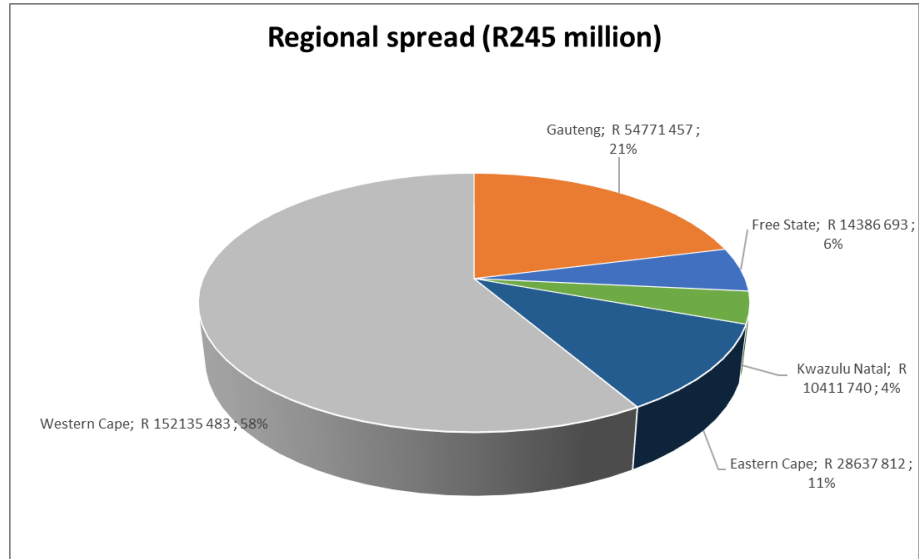
Historical investment portfolio*:	R231 682 555
Current committed investments:	R47 002 496
Of which active disbursing project total value is:	R47 002 496
Contracted investment split:	-
Grants	R234 343 185
Loans	R11 000 000
Equity	R0
Deal pipeline:	
No. of active disbursing projects:	3
No. of active non-disbursing:	14
No. of projects under workout and restructuring	0

PORTFOLIO ANALYSIS

Contracted Funds (R245 million)



Regional spread (R245 million)



Commercialisation

- *Commercialization is the process of transforming a new product or service all the way from conceptualization to actual sale. In other words, a product is created and brought to the market for profit. The commercialization process follows several stages that start with research and end with a product's marketing.*
- **Commercializing Your Innovation**
 1. Licensing the technology to an industry partner. ...
 2. Licensing the technology to an existing startup company. ...
 3. Creating a startup company to take the innovation to market.

Commercialisation Process

- Technology assessment
 1. *What problem does the technology solve?*
 2. *What existing methods/solutions/products solve the same problem and how is your invention different/novel?*
 3. *What are the existing and potential application areas of the technology/invention?*
- Market assessment
 4. *What benefits does the technology present for each market/application?*
 5. *What are the market opportunities that exist and how significant are they?*
 6. *Which market to pursue?*

Commercialisation

- Patent landscape analysis
- *7. Are there any similar patents/applications that exist?*
- *8. How mature is my patent?*
- *9. What other complementing patents or technologies can help enhance my final product offering?*
- Technology commercialization route
- *10. What are the commercialization routes available to me?*



Thank You
