



DSI 2023/24 APP

**Select Committee on
Education and Technology,
Sport, Arts and Culture**

Dr Phil Mjwara, DSI DG

24 May 2023

M Making < sure (it's *possible*)



science & innovation

Department:
Science and Innovation
REPUBLIC OF SOUTH AFRICA



Purpose

To present and reflect on the DSI 2023/24 Annual Performance Plan alignment to the

- NDP three Pillars;
- 2019-2024 RMTSF Apex Priorities;
- Budget Prioritisation Framework towards 2023 priorities;
- Gender-Response Planning Budgeting Monitoring Evolution and Auditing Framework;
- 2023 SONA commitments; and
- DSI Mandate expressed on 2019 WP on STI, the STI Decadal Plan and 2020-2025 Strategic Plan.

The DSI 2023/24 Annual Performance Plan

**ANNUAL
PERFORMANCE
PLAN**

**2023
2024**

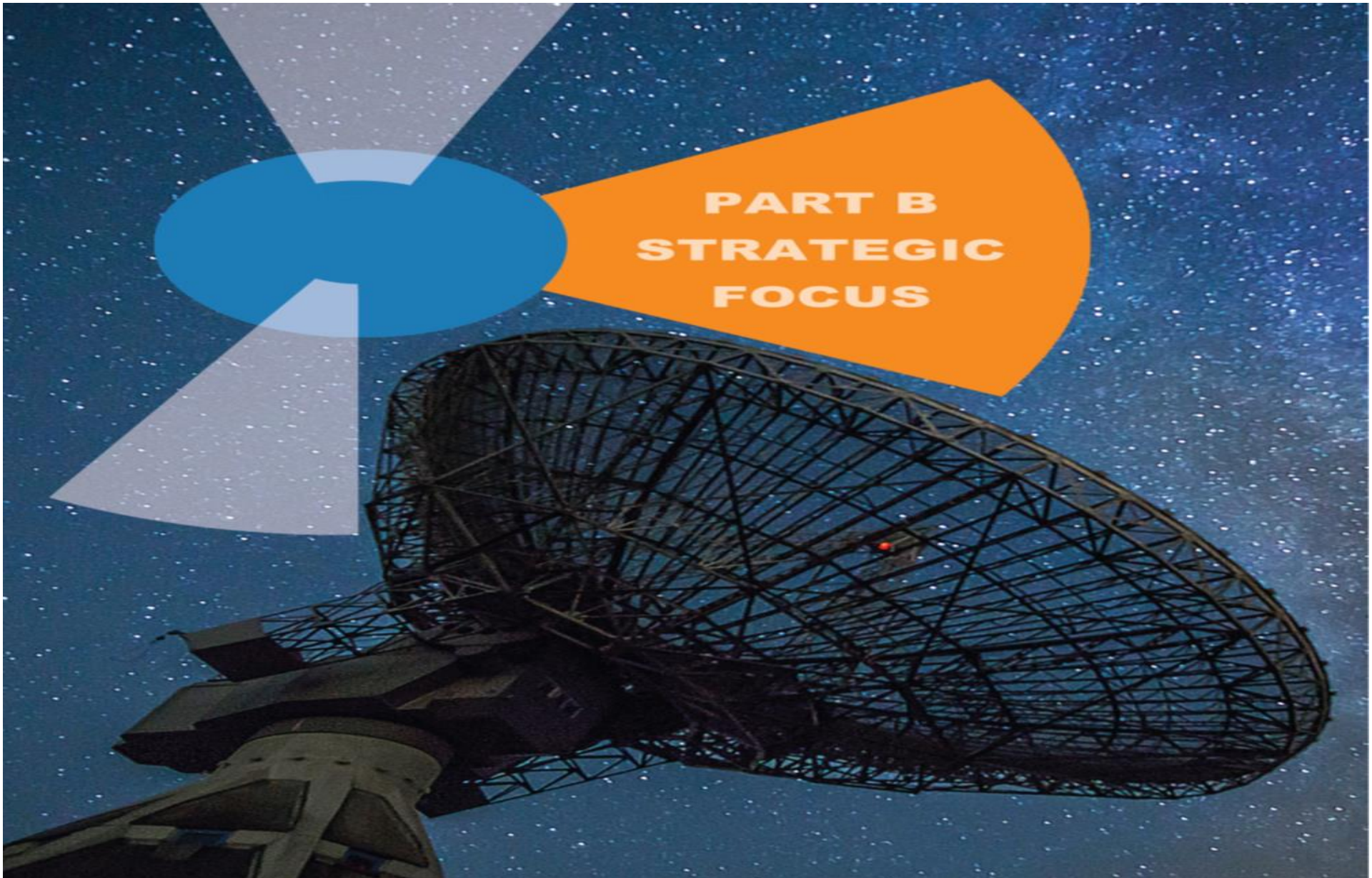
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**PART B
STRATEGIC
FOCUS**

Policy and Strategic Context

- The 2023/24 strategic planning horizon **marks the last year of implementation of 6th Administration mandate** and **fourth year of implementation** of the 2020-2025 medium-term taking into account the:
 - The NDP three Pillars:
 - Achieving a more capable State;
 - Driving a strong and inclusive economy; and
 - Building and strengthening the capabilities of South Africans.
 - The 2019-2024 RMTSF apex priorities, the Department has commitments on two of the seven (**apex priority 2 and 3**) viz;

DSI: MTSF Priorities

Apex Priority 2: Economic Transformation and Job Creation

- Improve competitiveness through ICT adoption – the GERD and IP commercialisation.
- Investing for accelerated inclusive growth – Skills Priority Plan led by Department of Higher Education and Training (DHET) and supported by the Department.
- Industrialisation, localisation and exports – Masterplans developed for all national priority sectors.

Apex Priority 3: Education, Skills and Health

- Expansion of access to Post School Education and Training (PSET) opportunities.
- Improving success and efficiency of the PSET system.
- Improving the quality of provisioning within the PSET system.
- Ensuring the PSET system is responsive to the needs of industry and society at large.

Other MTSF aspects of relevance to the DSI and its Entities

Women, Youth and People with disability as designated groups.

- Gender-responsive Planning, Budgeting, Monitoring, Evaluation and Auditing Framework – initiatives focus on Women, Youth and Persons with Disability.
- Data disaggregation at Planning and M&E levels.

Apex Priority 1: A Capable, Ethical and Developmental State.

- Innovation in support of a capable and developmental state.
- District Development Model (DDM) to improve the coherence and impact of government service delivery and access to basic services.
- Provide timely, accurate and independent data and information for mega projects monitoring and evaluation.

Other MTSF aspects of relevance to the DSI and its Entities (cont.1)

Priority 2: Economic Transformation and Job Creation

- Achieving 100% universal broadband by aligning and contributing to the DoC Satellite Communication Strategy.

Priority 3: Education, Skills and Health

- TB treatment research success rate.
- Better diagnostics.
- TB therapies.
- Local manufacturing of TB drugs and Vaccines.
- Development of treatment and prevention technologies for HIV, NCD and maternal health care.

Priority 4: Consolidating the social wage through reliable and quality basic services

- Innovative technology approaches for the delivery of basic services (energy, water, sanitation, roads).

Other MTSF aspects of relevance to the DSI and its Entities (cont. 2)

Priority 6: Spatial integration, human settlements and local government

- Provision of applications and products for precision agriculture, human settlement and water bodies information layers.
- Demonstrations in partnership with the Department of Mineral Resources and Energy to assess the appropriateness of new technologies such as hydrogen fuel cells to improve service delivery.
- Provision of information for air quality information system, land cover and land use mapping, frequent information on weather patterns, and human activity on critical resources such as water, land and air.
- Provision of decision support tools, human settlements layer, water bodies information layer.

Other MTSF aspects of relevance to the DSI and its Entities (cont. 3)

2023 SONA Commitments

- Just Energy Transition; and
- Skills Development in the Digital and Technology Sector.

The 2019 WP on STI give expression to the mandate of the DSI and has identified seven (7) objectives and 29 Policy intents across four of seven chapters namely:

- A coherent and inclusive NSI;
- An enabling innovation environment in South Africa;
- Increased human capabilities and expanded knowledge enterprise; and
- Financing of the STI.

Other MTSF aspects of relevance to the DSI and its Entities (cont. 4)

The 2021-2031 STI Decadal Plan has two mutually reinforcing aims in deepening the knowledge economy for enhanced socio-economic impact viz,

- Pivoting the NSI towards making an increased positive impact on SA's socio-economic & environmental priorities.
- Maintaining equilibrium between focus on impact (*e.g., inclusive innovation*) and continued investment to develop the system (*e.g., systemic enablers such STI budget coordination, Innovation and Skill compact, Strategic Management Model*) etc.

Other MTSF aspects of relevance to the DSI and its Entities (cont. 5)

The **Decadal Plan** has identified:

5 system goals and the associate outcomes (*Inclusive & coherent NSI; Expanded and transformed research system; Increase and future-proof human capabilities; Enabling Innovation environment; and Significantly increased funding of the NSI*).

6 STI priorities – Modernising sectors of the economy – *Manufacturing, Agriculture and Mining*; New Sources of Growth – *Digital Economy and Circular Economy*; Health Innovation; Energy Innovation; Innovation-enabled capable state; and Innovation in support of social progress.

3 SGC – Climate Change & Environmental Sustainability; Future-proof Education; and the Future of Society.

-in implementing the 2019 White Paper on STI policy intents into the DSI planning instruments – 2020-2025 SP, 2023/24 APP and AOPs.

Modernising Existing Industries: Agriculture

ICT-based Applications in sectors modernisation

Agriculture

- The applications of digital technologies are expected to drive competitiveness by addressing several productivity challenges.
 - Some of these productivity challenges that can be addressed by digitisation and precision tools include the high and volatile input costs (fertiliser, water etc.), delayed detection of crop and animal diseases outbreaks and inability to timely access market trading information by the farmer, in particular small-scale farmers.
- Advances in ICT-based applications offer precision-driven solutions for the agricultural sector.
 - For example, the use IoT based on the integration of satellites, drones, and sensors technologies are driving crop monitoring improvements and diseases diagnosis - saving the sector millions of Rands from lost production.

Modernising Existing Industries: Manufacturing

ICT-based Applications in sectors modernisation

Manufacturing

- Manufacturing: Advances in ICT-based applications are of critical importance in driving productivity improvement in manufacturing in line with the STI interventions aimed at:
 - enabling small business to adopt high tech,
 - new thinking for new industries; and
 - new thinking for mature industries.
- ICT-based innovations are set to play a crucial role in addressing the issues of growth, productivity improvements, sustainability and the current low number of successful and sustainable high-tech manufacturing start-ups, faced by various manufacturing subsectors.

Modernising Existing Industries: Mining (cont.1)

ICT-based Applications in sectors modernisation

Mining

- The minerals industry contributes significantly to South Africa's internal energy requirements, trade balance, internal investment, domestic savings, foreign capital, and direct and indirect employment creation.
- Increasing costs, declining grades and the increasing average depth of precious metal mining are some of the factors weighing heavily on the production profile of the main commodities, and as the industry moves forward, there will be a greater need to streamline existing processes, improve recoveries and find innovative new cost-efficient ways of extracting these commodities.

Exploiting new sources of growth: The Circular Economy (CE)

- An estimated 50% of GHG Emissions, 90% of water stress and 90% of global biodiversity loss is attributed to resource extraction and processing (UNEP & IRP, 2020).
- CE approaches also create jobs and economic efficiencies.

Sector	e.g. Climate impact	e.g. Circular economy interventions*
Mining	<ul style="list-style-type: none"> • Resource extraction, energy consumption (fossil-based) 	<ul style="list-style-type: none"> • Regenerative, renewable energy
Energy	<ul style="list-style-type: none"> • Fossil-based energy generation (electricity, fuels) 	
Agriculture	<ul style="list-style-type: none"> • Globally, food losses and waste a major GHG emitter • SA food losses and waste 2.1% of GDP (34% of local production) • Sector vulnerable to changing climates (temperature, rainfall) 	<ul style="list-style-type: none"> • Reducing wastage • Minimising resource inputs • Regenerative farming • Unavoidable waste beneficiated
Manufacturing	<ul style="list-style-type: none"> • Major contributor to GHG emissions through reliance on fossil-based fuels, high resource demands, inefficient use of resources 	<ul style="list-style-type: none"> • Regenerative, renewable energy • Disruptive 4IR technologies • Remanufacturing
Human settlements	<ul style="list-style-type: none"> • Cities contribute up to 75% of global carbon emissions 	<ul style="list-style-type: none"> • Change in resource use and wastage • Urban agriculture
Mobility	<ul style="list-style-type: none"> • 98% of SA's transport sector's energy from petroleum products • 77% of land freight is still transported via road in 	<ul style="list-style-type: none"> • Change in mobility systems

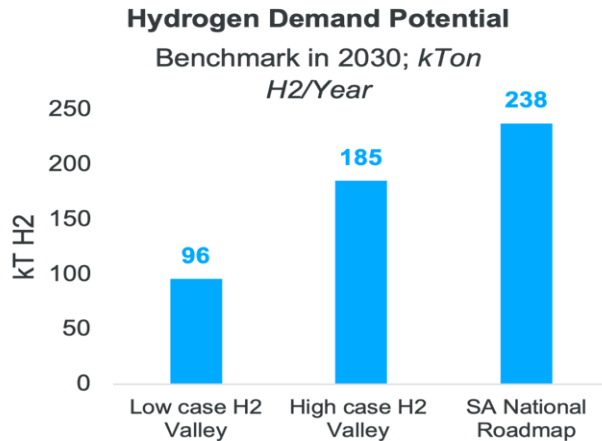
Catalytic Projects

To kick-start the development of a hydrogen society in South Africa, a number of catalytic projects have been identified in partnership with private sector e.g., :

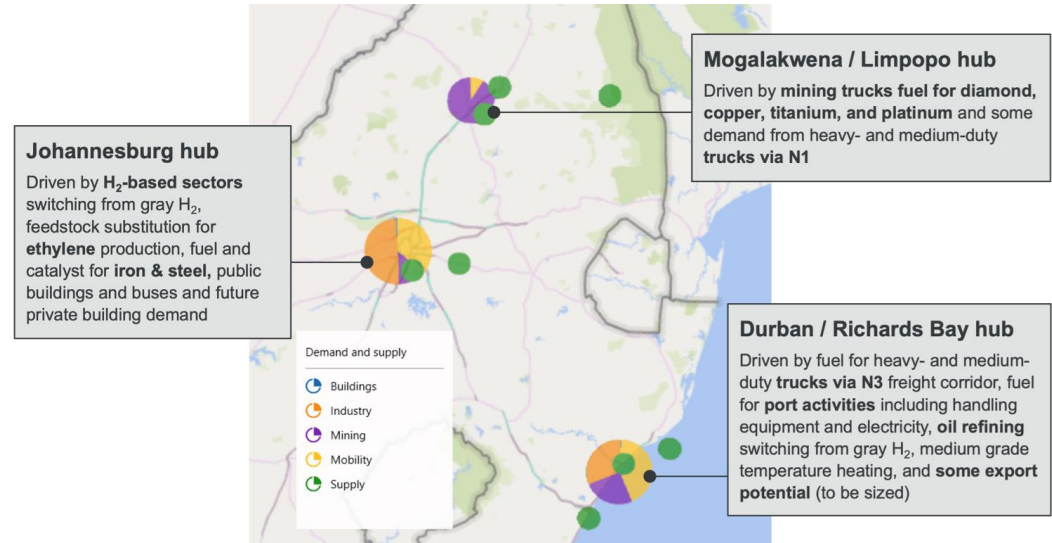
- **Hydrogen Valley or Platinum Valley Initiative:** (Service Provider appointed to work on Platinum valley model. Gazetted under SIP in December 2022).
- **CoalCO₂-X project:** Launched with PPC Cement on the 25 January 2023 to: capture CO₂ and combine with green ammonia to form fertilizer. Reduce CO₂ from the flue gas emitted to assist PPC to reduce carbon tax payment.
- **Sustainable Aviation Fuels:** Still on conceptual stages
- **Boegoebaai Special Economic Zone:** Collaborated with SASOL to establish 4 hubs for local and international intellectual property e.g. Production of ammonia and Production of Green Hydrogen

Platinum Valley – structured around three hydrogen hubs

H2 DEMAND



H2 VALLEY HUBS



- ❑ H₂ demand in the Valley could reach up to 185 kt H₂ by 2030, or 40%-80% of demand in the national hydrogen roadmap.
- ❑ By 2030, green H₂ LCOH across hubs is expected to be ~\$4 per kg H₂, still more expensive than gray hydrogen, with a green premium of \$2-\$2.5 per kg.

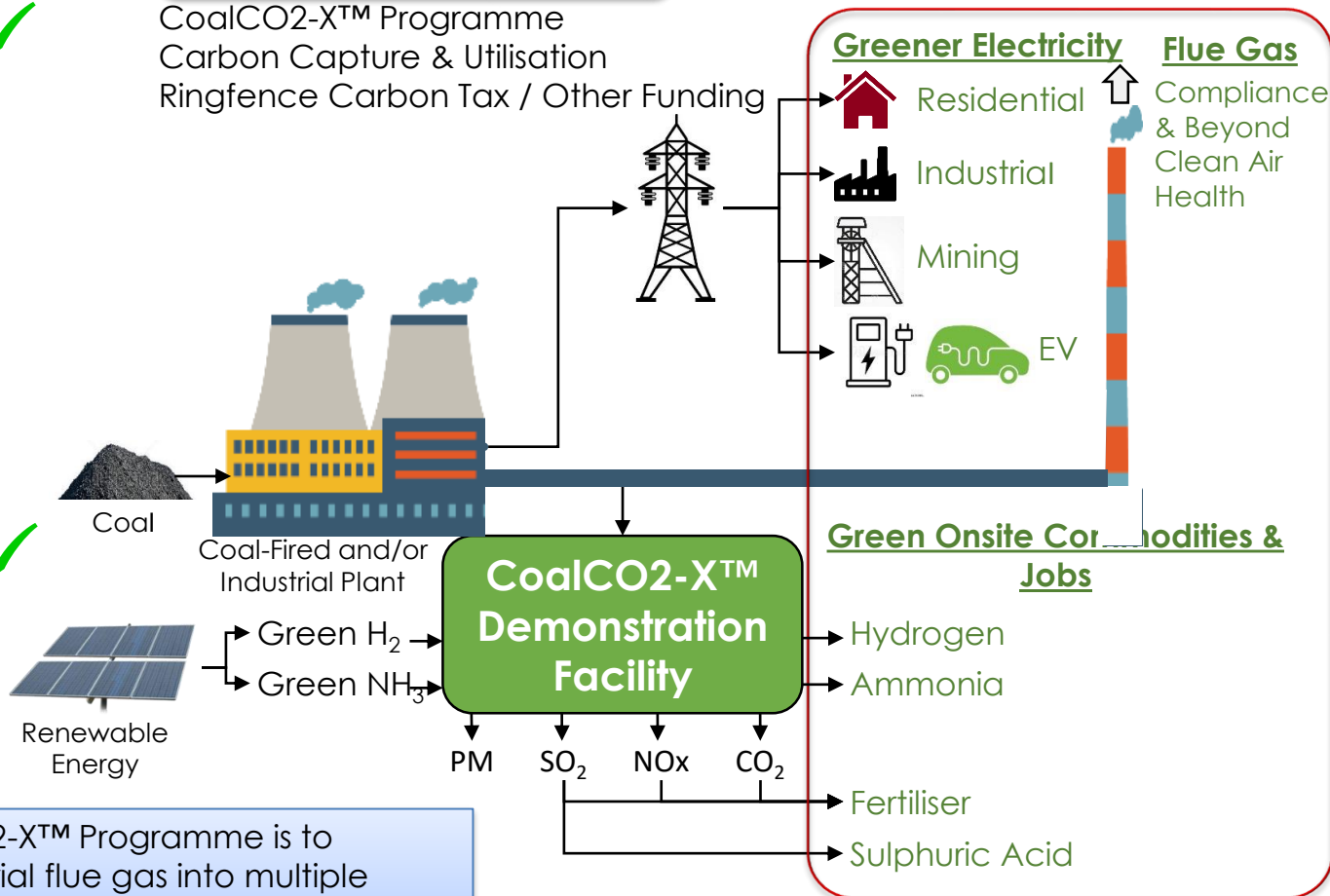
CoalCO2-X Programme

Challenges

- Global COP21 (Paris Agreement) Commitments** ✓
 CO₂ → PPD trajectory;
 Carbon Tax: Eskom R11bn/y, Sasol R1bn/y
- Local Pollutant Legislation** ✓
 PM, Hg, NO_x, SO_x → Industry Non-Compliance 1 April 2020
- Environmental Crises** ✓
 Poor Air Quality → Sickness, Death, Decreased Economic Productivity, Changing Weather Patterns i.e. Drought & Floods
- Constitutional Right vs Litigation** ✓
 Criminal Proceedings → Mittal, Min. of Env. Affairs & President

Proposed Solution

CoalCO2-X™ Programme
 Carbon Capture & Utilisation
 Ringfence Carbon Tax / Other Funding



Resulting in:

The objective of the CoalCO2-X™ Programme is to convert coal-fired and industrial flue gas into multiple onsite industrial commodity streams using green ammonia and green hydrogen employing local and international IP.

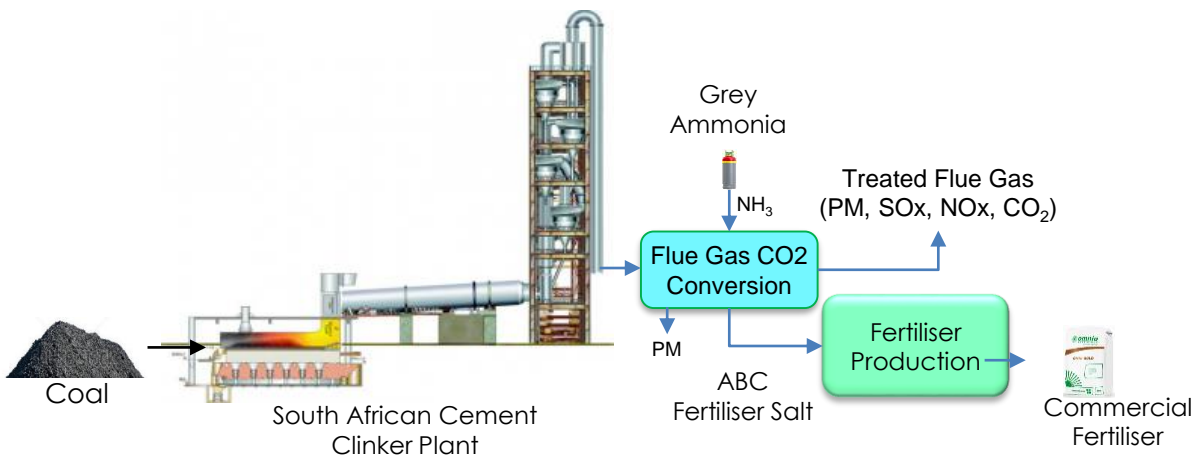
Towards a Carbon Capture and Utilisation Economy

Pilot Technology Demonstration & Training

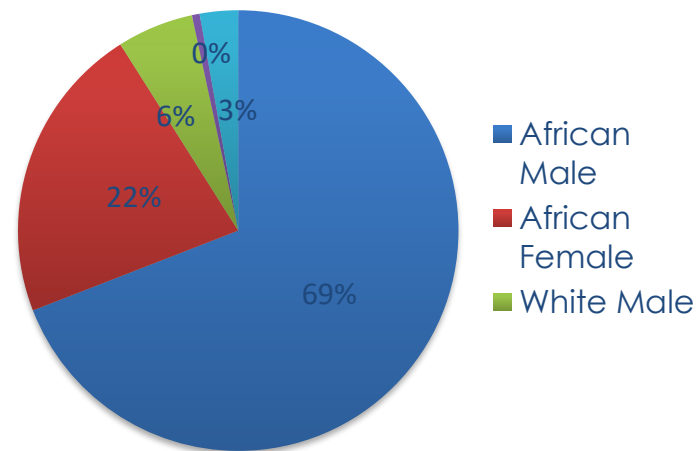
Hard-to-Abate Cement Industry Pilot Plant Demonstration in 2022

CoalCO2-X™ Programme Awareness Training Completed in 2021

Capture: PM + Heavy Metals
Convert: CO₂ and NO_x into Fertiliser



Future upscaling and demonstration at coal-fired power generation plants



Awareness Training done for 178 Students

Future training of engineers and technicians in hydrogen and CCU technologies

Sustainable Aviation Fuels: Key Actions and Milestones

2021-2024

PRODUCTION

- Small scale electrolysis production
- At least 1MW GH2 production piloted



2025-2030

PRODUCTION

- 5GW electrolysis capacity under construction in NC
- 10GW electrolysis capacity deployed in NC by 2030
- 1.7GW electrolyser capacity deployed in H2 Valley by 2030
- At least 500kt H2 produced annually by 2030



2030-2040

PRODUCTION

- Increase electrolysis capacity to at least 15GW by 2040



USE

- At least 100 buses and trucks powered by H2 by 2025
- At least 20 forklifts converted to fuel cell power by 2025
- At least 5 refueling stations deployed by 2025
- Demonstration in power generation and stationary fuel cells in public buildings
- Industry demonstration including SAFs



USE

- At least 500 buses and trucks powered by H2 by 2030
- Power generation in turbines using H2 and ammonia
- Sector coupling and use in transport, industry



USE

- Sector coupling and full use in transport, industry and power



JOBS

- Upscaling of training and reskilling for new jobs



JOBS

- At least 20 000 jobs created annually by 2030



JOBS

- At least 30 000 jobs created annually by 2040



Establish targets and policy signals



Support demand creation



Mitigate investment risk



Harmonize standards and remove barriers



Promote Research, Development and Innovation



Strategic demonstration and deployment projects

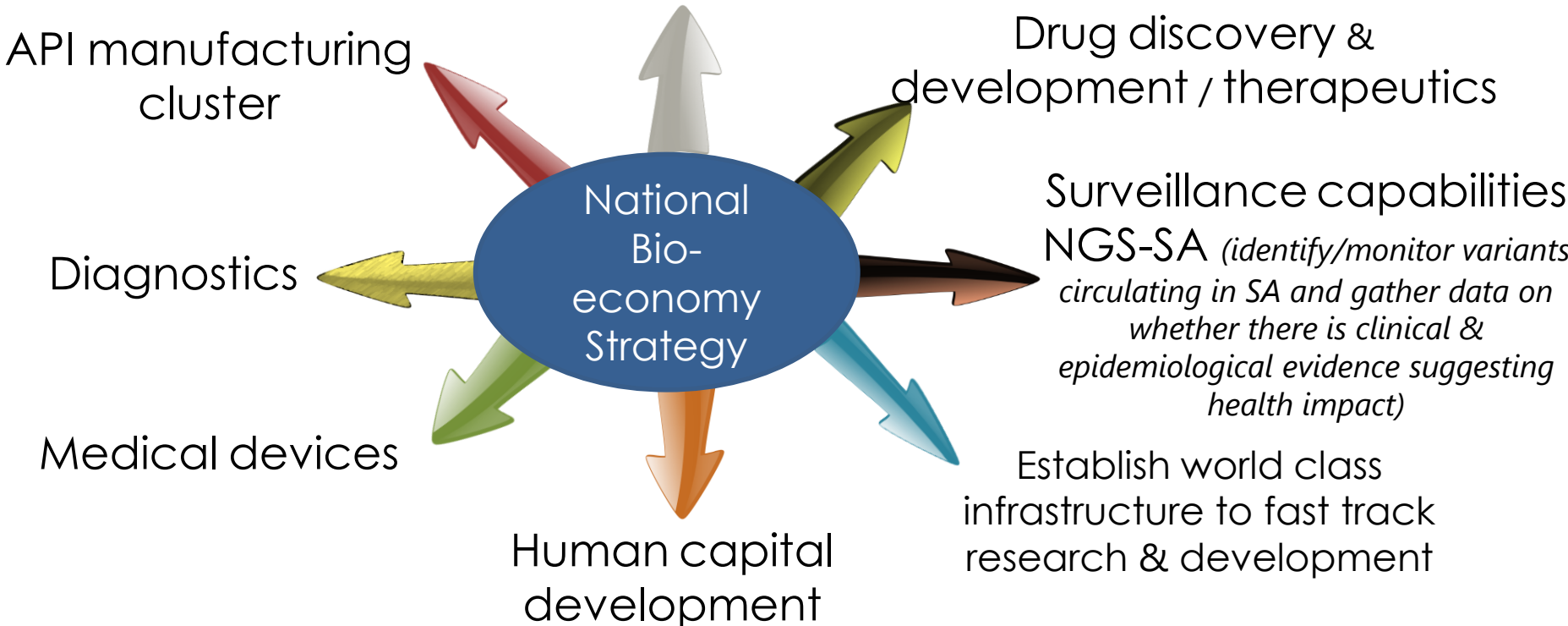


Skills development and public awareness

DSI Response to COVID-19

Support and strengthen the country's local research, development and innovation capabilities to manufacture active pharmaceutical ingredients, vaccines, biopharmaceuticals, diagnostics and medical devices to address the disease burden while ensuring security of supply of essential therapeutics and prophylactics.

Vaccine development & manufacturing to provide for adequate level of sovereignty



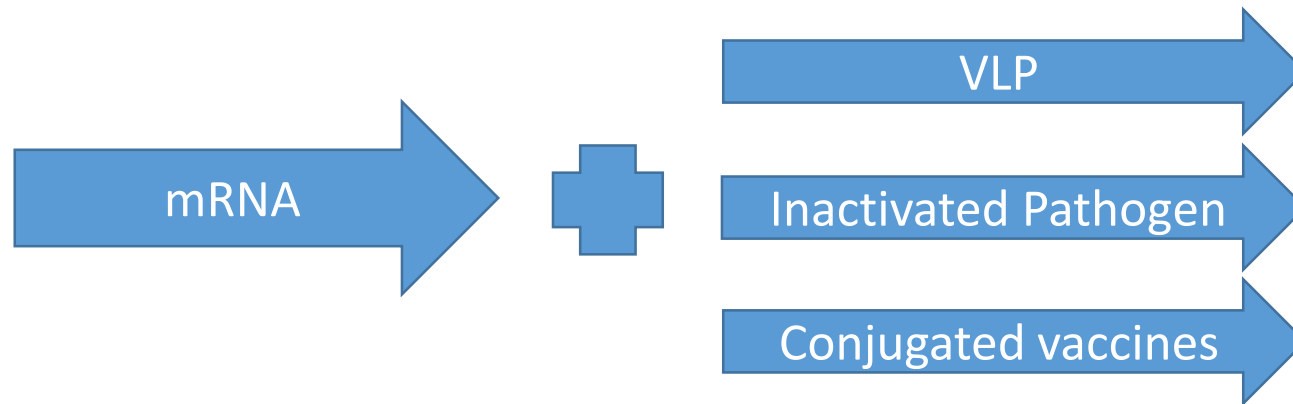
Proposed Technology Platforms (cont.)

Benefits:

- Short-term (improving trade balance and current account balance & create employment).
- Medium and long-term (building strategic national competency in life sciences & technology, providing strategic security of supply of vaccines nationally and regionally).
- The local production of vaccines to not only support the local demand, but also that of Africa and this could have significant revenue potential for South Africa and have a positive influence on our trade balance.
- Vaccine import dependence in Sub-Saharan Africa is rising, creating significant export opportunities for African manufactured vaccines.

Proposed Technology Platforms

- As informed by existing capabilities, propose three additional platforms to supplement mRNA Technology Transfer Hub, and the subsequent development of a business case for the three platforms.



- mRNA partners** – WHO, CEPI, Africa CDC, Biovac, Afrigen Biologics, SAMRC, MPP, French Government and a network of local universities to develop, manufacture and distribute locally developed vaccines for Africa-specific COVID-19 variants as well as future pathogens threatening the health of people on the continent. Partnership for Biovac to manufacture and distribute the Pfizer/BioNTech COVID-19 vaccine for distribution within the African continent.

African Medicines and COVID-19 Research



- The DSI established the Indigenous Knowledge-Based COVID-19 Research Team, a sub-team of the African Medicines Platform of the department
- The team is constituted by African medicine practitioner organisations, science councils, universities and government department
- Two multi-herbal and seven mono-herbal formulation were selected out of twenty medicines historically used in the treatment of respiratory conditions
- A total of R15 million was re-aligned from existing project on other health conditions under African medicines, nutraceuticals, health infusions, technology transfer and commercialisation platforms
- Two multi-herbal and two mono-herbal formulations have progressed to clinical trial phase; and one has received a SAHPRA approval
- Forty IK-Holders were trained through a 6-month CoachLab Programme on Bio-Entrepreneurship and Enterprise Development

African Medicines and COVID-19 Research (cont.)



World Health
Organization
Regional Office
for Africa

- South Africa is the current chair of the WHO-AFRO's Regional Expert Committee of African Medicines and COVID-19.
- R18 million has been leveraged for Phase II clinical trials from the Technology Innovation Agency.
- R1 million was leveraged to support agro-processing and manufacturing activities for supporting IK-Based SMMEs producing health products (immune modulators and boosters).
- R1.7 million was leveraged to support the establishment of a committee to develop a legal framework for inclusion of African medicines in Essential Medicines List at SAHPRA.
- The Impact of COVID-19 on African Medicines Practitioners and their participation in Epidemic Preparedness and Response was concluded.
- Medicinal Cannabis aspects of the Presidential Master-Plan on Industrialisation of Cannabis are being investigate for COVID-19 and other priority health conditions.



EDCTP



AFRICA CDC
Centers for Disease Control and Prevention
Safeguarding Africa's Health

Innovation in support of a capable and developmental state (cont.1)

- **Innovative technology solutions for basic service delivery:**
Water resources management, waste management, green and renewable energy solutions, sanitation, etc
- **Decision support tools:** Energy, sanitation, procurement, spatial planning, human settlements, service delivery, infrastructure, risk & disaster management, health, climate change, etc
- **Integration of innovation in the public sector** through an enabling policy environment.

Innovation in support of a capable and developmental state (cont.2)

- **Innovation capacity, capability and measurement:**
Strengthen innovation capacity for the delivery of basic services in municipalities through enhancing learning and capacity building across targeted municipalities on technology and innovation management; innovation capacity of municipalities, etc
- **Integration of innovation in the public sector** through an enabling policy environment.
- **e-Participation and policy modelling** for local government to enable open collaboration in modelling public policies.

Active Contributions and Outputs (to date)

- ❑ Weekly Data Analytics & Reports
- ❑ Research and Monitoring
- ❑ Technical Data Advisory
- ❑ Global Data Trends and Analysis
- ❑ Forecasting and Projections
- ❑ Collaborate with other NATJOINTS work streams such as threat and risk assessments, travel, law enforcement with data and analysis
- ❑ Resurgence tracking and monitoring

- ❑ Collaboration with DPME on monitoring and evaluation of the national vaccination programme
- ❑ Active data collection and analysis on various vaccination indicators
- ❑ Modelling, forecasting, and projections of the vaccination indicators
- ❑ Support NDOH with secondary data analysis
- ❑ Technical Data Advisory

- ❑ Correlating vaccination data and case data
- ❑ Global trends on vaccination
- ❑ Social Media Trend Analysis
- ❑ Communication Campaigns Trends Analysis
- ❑ Misinformation Data Collection and Sharing
- ❑ Strategies for Curbing Misinformation Online
- ❑ Research and Models Development



Societal Grand Challenges

Global change – Knowledge Generation

- ❑ Global Change Research Plan for SA, 2010
- ❑ Key principles underlying GCRP include:
 - ✓ Adopts a systems approach;
 - ✓ Inter-, multi- and trans-disciplinary approach to research;
- ❑ Recognises SA's advantageous geographical location - surrounded by three oceans that influence the climate system of the southern African region
- ❑ 4 knowledge areas and 18 research themes
- ❑ GC research programmes & initiatives:

10-Year Global Change
Research Plan for **South Africa**



A Understanding a changing planet	B Reducing the human footprint	C Adapting the way we live	D Innovation for sustainability
<ol style="list-style-type: none"> 1. Observation and monitoring 2. Dynamics of the oceans around southern Africa 3. Dynamics of the complex internal earth system 4. Linking the land, air and sea 5. Improving model predictions at different scales 	<ol style="list-style-type: none"> 1. Waste-minimisation methods and technologies 2. Conserving biodiversity and ecosystem services 3. Institutional integration to manage ecosystems and ecosystem services 4. Doing more with less 	<ol style="list-style-type: none"> 1. Preparing for rapid change and extreme events 2. Planning for sustainable urban development in a South African context 3. Water security for South Africa 4. Food and fibre security for South Africa 	<ol style="list-style-type: none"> 1. Dynamics of transition at different scales – mechanisms of innovation and learning 2. Resilience and capability 3. Options for greening the developmental state 4. Technological innovation for sustainable social-ecological systems 5. Social Learning for sustainability, adaptation, innovation and resilience

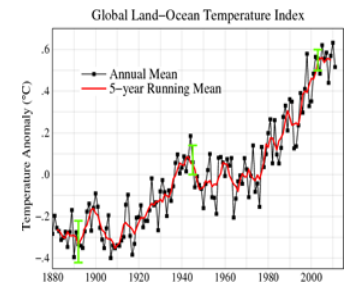
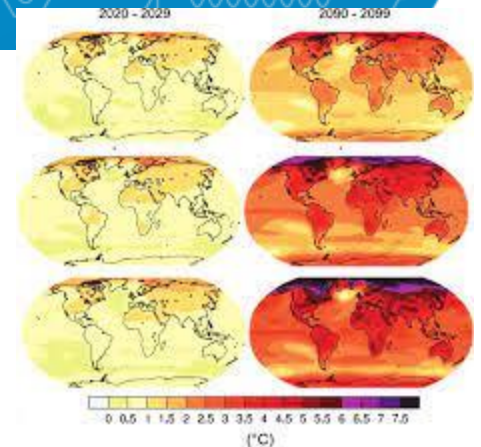
The Global Change Research Plan identifies four major cross-cutting knowledge challenges and 18 key research themes.



ACCESS



- **ACCESS** is a CSIR- hosted virtual network of collaborating partners (*research entities and universities*) and programme focusing earth systems science
- Flagship programmes include Habitable Planet Workshops (HPW), Conversations on Climate Change series etc.
- Contributes to:



□ **Investment:** Over R200m (13yrs); ave. R16m/yr



National
Research
Foundation

□ **SAEON** is a comprehensive, sustained, coordinated and responsive South African environmental observation network that delivers long-term reliable data for scientific research and informs decision-making; for a knowledge society and improved quality of life.

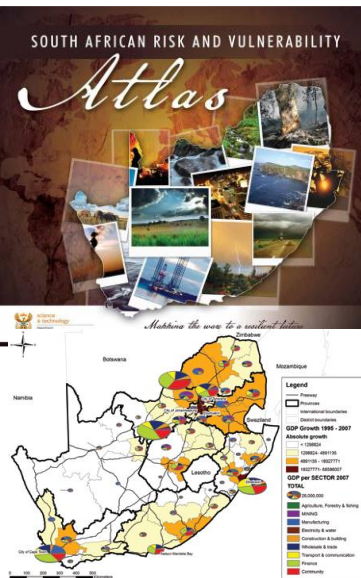


□ Contributes to:



□ **Investment** - Over R320m (13yrs); ave. R25m/yr

SARVA & SCIENCE CENTRES



□ **SARVA** – A “one-stop-shop” spatial database system aimed at equipping decision-makers with information on the impacts and risks associated with global change at local level.

□ **RVSC** - A complimentary programme aimed at building capabilities of rural-based universities in the area of environmental risks and vulnerability assessment. Current participants - Walter Sisulu (WSU), Fort Hare (UFH), Limpopo (UL), Free State –QwaQwa (UFS) and Sol Plaatje (SPU) Venda (future)



□ **Investments** - R4m/yr for SARVA; R4m/RVSC/yr

Global Change Performance and Investment Council

Intr'l Resource Mobilising Team

Science Committee

South African Environmental Observation Network (SAEON)

Space Agency (Global Change Monitoring Network)

SA Polar Research Entity

Knowledge Brokering Support Unit

Africa Earth Observation Network (AEON) programmes

Inkaba ye Africa/ !Khure Africa

Centre of Excellence

Applied Centre for Climate and Earth Systems Studies (ACCESS)

Large scale research programme Global Change, Society, and Sustainability

South African Risk and Vulnerability Atlas (R&V Atlas)

Bureau for Global Change Science

R&V science centres



**PART C
MEASURING
OUR
PERFORMANCE**

DSI 2020-2025 Strategic Plan

- Consist of **six (6) strategic institutional outcomes** and **nineteen (19) associate outcome indicators** against which the Department's medium-term performance and results will be measured and evaluated.
- The DSI 2023/24 Annual Performance Plan (APP) marks the last year of implementation of the 6th Administration mandate and priorities expressed on the 2019-2024 RMTSF apex priorities.
- In implementing the DSI Revised 2020-2025 Strategic Plan, the 2023/24 APP identified seventy-three (73) output performance indicators, and medium-term targets that the Department seeks to achieve.

DSI Performance Information

Impact statement: *South Africa's sustainable and inclusive development enabled and enhanced through Science, Technology and Innovation.*

A transformed, inclusive, responsive and coherent NSI

Human capabilities and skills for the economy and for development

Increased knowledge generation and innovation output

Knowledge utilisation for economic development:
(a) in revitalising existing industries
(b) in stimulating R & D led industrial development

Knowledge utilisation for inclusive development

Innovation in support of a capable and developmental State

Partnerships

Internationalisation

Transformation

Outcome 1: A transformed, inclusive, responsive and coherent NSI

Planned policy initiatives/ targeted interventions:

- ❑ Finalise Transformation Framework to expand transformation agenda in all strategic STI focus areas through ten key transformation dimensions. **[transformed]**
- ❑ Support grassroots innovators and support new entrants into the economy, via targeted RDI instruments. **[inclusive]**
- ❑ Modernisation of sectors of the economy such as manufacturing, agriculture and mining to ensure that these sectors are competitive and can contribute to higher GDP growth. **[responsive]**
- ❑ Implement the 2019 WP on STI policy thrusts/intents through the 2021-2031 STI Decadal Plan Priorities and Societal Grand Challenges. High-level structures (*Annual IMC on STI, and STI Presidential Plenary*) for STI agenda setting across government. **[coherent]**

Outcome 2: Human capabilities and skills for the economy and for development

Planned policy initiatives/ targeted interventions

- Implement new Postgraduate Funding Policy that provides for Full Cost of Support for certain groups of students, namely, the financially needs, students with disabilities and the exceptional academic achievers.
- Support more than 7 080 Honours, Masters, PhD students including IP management and technology transfer across programmes as identified in different sector master plans and the STI Decadal Plan priorities.
- Support the development of critical skills of UoT and TVET graduates, artisans, technicians, post doctoral researchers offered experimental training through employment in the energy, space and bioeconomy sectors of the economy.

Outcome 2: Human capabilities and skills for the economy and for development (cont.)

Planned policy initiatives/ targeted interventions

- Award 3200 research grants to established and emerging researchers particularly black female researchers to help increase the percentage of lecturers and senior who are PhD-qualified and publishing.
- Support the development of critical high-end skills in selected technology areas such as the Foundational Digital Capabilities, Bioeconomy, Space science and technology, Energy, IP management, Nanotechnology, Robotics, Photonics and areas of Technology Convergence that are important in building a knowledge society.
- Mainstream themes in research grants covering all knowledge fields.

Outcome 3: Increase knowledge generation and innovation outputs

Planned policy initiatives/ targeted interventions

- ❑ Increase South Africa's research outputs/productivity, and its world share of publications towards the 1% of global output.
 - fast-tracking interventions aimed at PhD qualification among non- PhD-qualified staff; and
 - Interventions to improve the publishing rate of academics at HDIs to increase research outputs per capita.

- ❑ Expand the roll-out of the South African National Research Network (SANReN) to TVETs and increase the total available broadband capacity to 6500 Gbps.

Outcome 3: Increase knowledge generation and innovation outputs (cont.)

- ❑ Measure and track the number of outputs commercialised as a result of support provided in designated areas; e.g. licenses, assignments, options of varying nature (such as directed research, joint ventures and the like), start-ups, spin outs, new companies etc.,
- ❑ Establish IK-Based Bio-Innovation Institute to interface and mainstream African wisdoms for applied integral research, inclusive innovation, local technology transfer, holistic enterprise development and conscious commercialisation.

Outcome 4: knowledge utilisation for economic development in (a) revitalising existing industries (b) stimulating R&D led industrial development

Planned policy initiatives/ targeted interventions

- Use the Innovation Fund as a leveraging financing instrument between the public and private sectors (2023/24 – R490million; 2024/25 – R510million; and 2025/26 – R569.211million) to harvest and commercialise the South African technology innovations for deployment in national and international markets.
- Participate in the development of sectoral master plans i.e. agriculture, the oceans economy, energy, mining and health.
- Implement common flagship programmes in support of priority sectors reflected in the national reimagined / revitalised industrial strategy.
- Continue managing a portfolio of projects with a potential of creating new industries or rejuvenating existing industries.

Outcome 4: knowledge utilisation for economic development in (a) *revitalising existing industries* (b) *stimulating R&D led industrial development (cont.)*

- Using industrial ports as the nerve centres for scaling up the use of clean hydrogen towards building a Hydrogen Economy in SA.
- Partnering with the DMRE in deploying fuel cells at government buildings and critical infrastructure such as airports, rural formal and urban informal settlements to reduce the impact of rolling blackouts.
- Lead RDI aspect of the national master plan programme on medicinal cannabis and hemp in developing medicines, nutraceuticals and cosmeceuticals from cannabis in collaboration with other government departments, civil society, academia and business grounded on the principles of socio-economic transformation, i.e. inclusion of women and youth.

Outcome 5: Knowledge utilisation for inclusive development

Planned policy initiatives/ targeted interventions

- In line with the national development profile and social dynamics, the department will expand the multi-tiered package to support commercialisation of grassroots innovations, through technology development, compliance with industry standards where applicable, and protection of IP and mentorship.
- Facilitate commercialisation of grassroots innovation and its access to publicly available IP in line with the commitment for the deployment of locally developed technology solutions, using instruments such as technology demonstrations, agroprocessing facilities and support for entrepreneurs.

Outcome 5: Knowledge utilisation for inclusive development (cont.)

Planned policy initiatives/ targeted interventions

- More deliberate focus on IP related solutions that will enable and improve access to basic services, strengthen the capacity of the state in service delivery and promote the inclusion of women, youth and people living with disabilities.

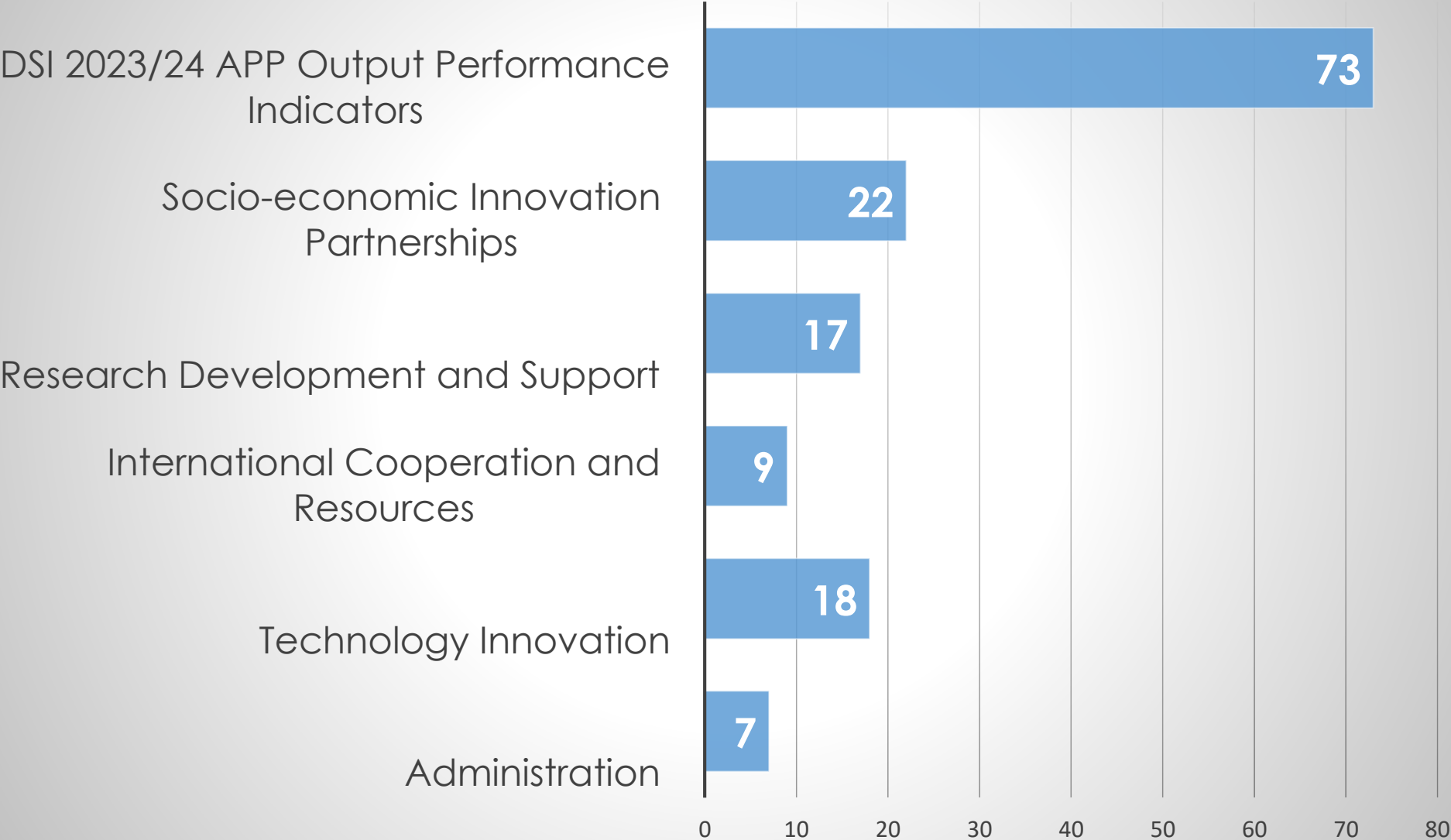
Outcome 6: Innovation in support of a capable and developmental state

Planned policy initiatives/ targeted interventions

- ❑ The Department will be more deliberate in promoting the expansion of piloted solutions that enable and improve access to basic services such as waste and water management, housing, sanitation and energy provision and strengthen the capacity of the state in service delivery.
- ❑ Locally developed technology deployment in support of the use of innovation in implementing State policies in Basic Education, e-Health, Infrastructure project scoping etc.

2023/24 Output Performance Indicator Analysis Programme

Number of Output Performance Indicators



The DSI_DDM Projects – 125 High Impact and Responsive Projects

Summary

Impact Area 1	43
Impact Area 2	54
Impact Area 3	23
Impact Area 4	5
	125

Impact Area (1)

Life Changing Opportunities

- skills development;
- training, innovation leadership skills;
- entrepreneurship support;
- digital skills;
- incentives and support for tech start ups, innovation SMME's, cooperatives;
- support for unemployed youth, women
- youth innovation incentive schemes

Impact Area (2)

Economic Competitiveness and Recovery

- local systems of innovation and production;
- circular economy;
- innovation for local economic development;
- innovation support for existing economic sectors such as mining, agriculture, tourism and manufacturing;
- support for new sources of growth;

Impact Area (3)

Access to Basic Services and Infrastructure

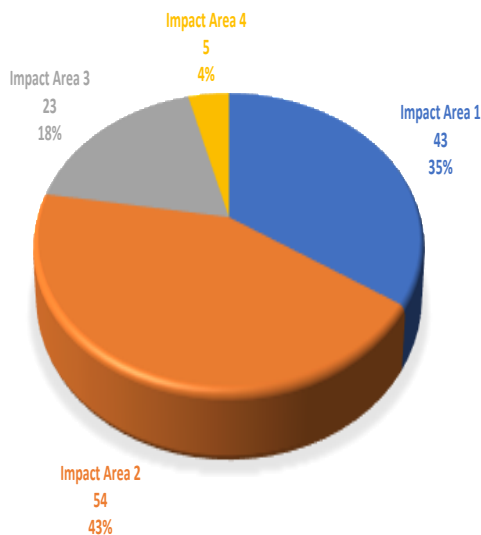
- basic service delivery such as water, energy, human settlements, education, waste management, health and sanitation;
- innovation infrastructure;
- community innovation, science support centres;
- community broadband connectivity;
- Research infrastructure;
- support for new sources of growth;
- smart cities, smart settlements and neighbourhoods

Impact Area (4)

Societal Problems, Challenges and Decision Support

- youth in drugs;
- environmental pollution and degradation;
- climate change and drought;
- safer cities and communities;
- social development;
- decision support tools;
- policy research

SUMMARY OF IMPACT AREAS



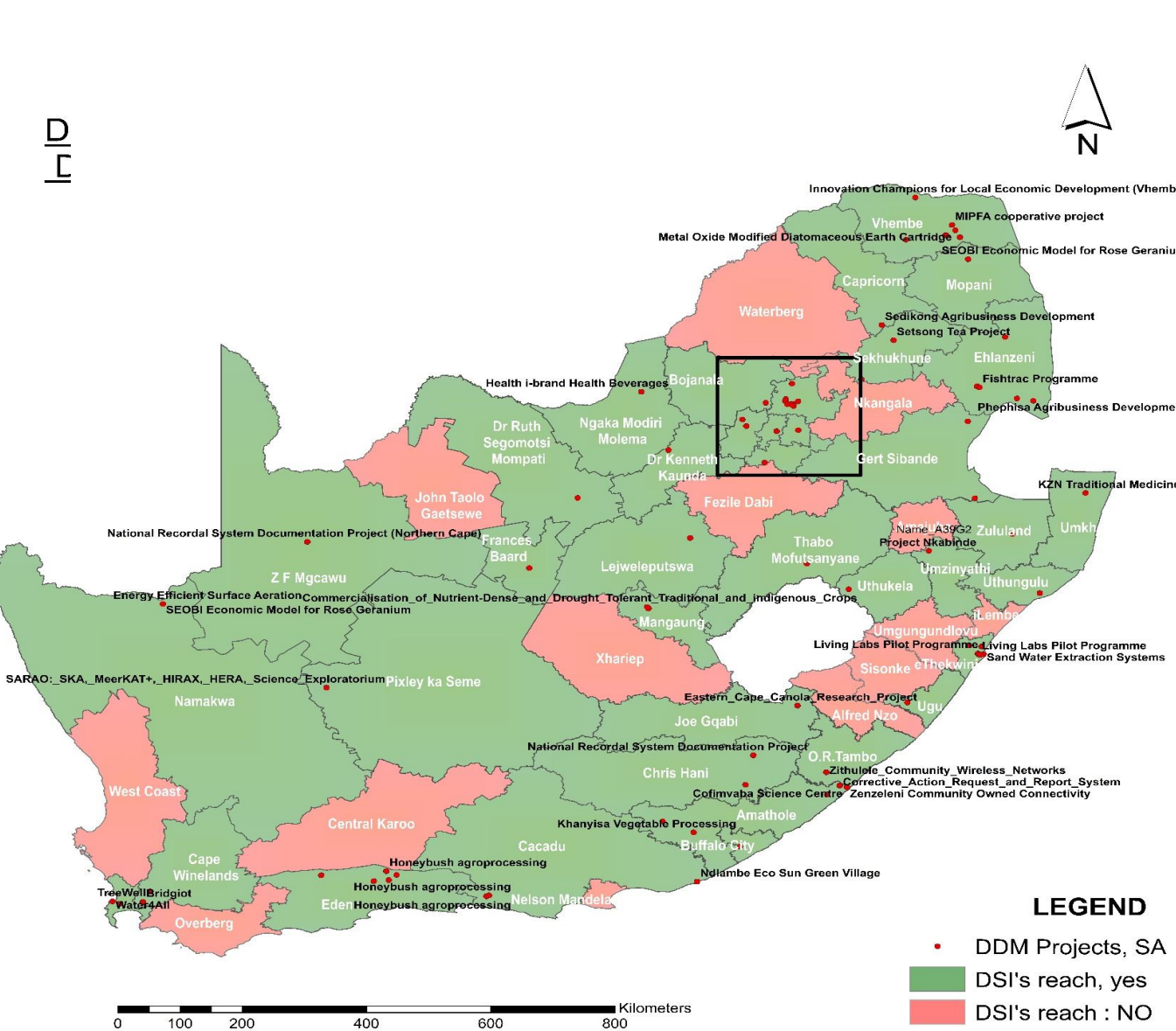
Geographic Footprint of DSI Projects Across 9 Provinces

DLI



DSI'S ACTIVE PROJECTS IN 2020/21 IN DISTRICTS

- Amathole -Health i-brand Health Beverages X2
- Amathole -Zenzeleni Community Owned Connectivity
- Amathole -Sand Water Extraction Systems
- Buffalo City -East London Regional Innovation Networking Platform
- Cape Winelands-Stellenbosch Network
- Cape Winelands-Winotech
- Capricorn -Sedikong Agribusiness Development
- Chris Hanu -Cofimvaba Science Centre
- CPT-TreeWell
- CPT-Enhanced Energy Harnessing Mechanism
- CPT-Water4All
- CPT-Shear Separation Flotation Technology Demonstrator
- CPT-Living Labs Pilot Programme
- CoT- Phedisangang Cooperative Agribusiness Development
- CoT- Molhong African Heritage Project
- CoT- Photo Voltaic testing centre
- CoT- NETFA facility
- CoT- Loo Afrique
- CoT- Slide-On Gutter Technology Demonstration
- CoT- Drinking water and saleable products from mine water
- CoT- Swallowing Toilet
- CoT- Biomufacturing Industry Development Centre
- CoT- Nanomaterials Industry Development Facility
- CoT- Photonics Prototyping Facility
- CoT- Regional Innovation Networking Platform
- CoT- National Recordal System Documentation Project
- Ehlanzeni -Phephisa Agribusiness Development
- Ehlanzeni -Phephisa Agribusiness Development
- Ekurhuleni- Gibela Manufacturing Centre
- Ekurhuleni- Look see Do
- Ekurhuleni- Precious and Semi-Precious Metals Value Recovery
- Ekurhuleni- Water Evaporation Experiment
- eThekweni - Living Labs Pilot Programme X2
- eThekwini - Science, Technology & Innovation Park
- eThekwini - Sector Innovation Fund with the Sugar Milling
- eThekwini - Biorefinery Industry Development Facility
- eThekwini - Research Institute
- eThekwini - SA Sanitation Technology Demonstration Programme
- Frances Baard- NC Regional Innovation Networking Platform
- Garden Route-Honeybush agroprocessing X3
- Garden Route-National Recordal System Documentation ProjectX
- Gert Sibande- National Recordal System Documentation Project X
- Lejweleputswa-Regional Innovation Networking Platform
- Mangaung - Nosetsa: Irrigation System Using Machine Learning
- Mangaung - Versatile integrated site Selection Tool
- Mbombela - Fishtrac Programme
- Mopani - SEOBI Economic Model for Rose Geranium
- Namakwa- SEOBI Economic Model for Rose GeraniumX2
- National-Grassroots Innovation Programme
- Nelson Mandela Bay - Energy Efficient Surface Aeration
- Ngaka Modiri Molema -Health i-brand Health Beverages
- Sekhukhune -Setsong Tea Project
- Stellenbosch -Bridgiot
- Umkhanyakude - KZN Traditional Medicines
- Umzinyathi -Project Nkabinde
- Vaal -Casting Simulation Network
- Vembe-MIPFA cooperative project
- Vembe-Metal Oxide Modified Diatomaceous Earth Cartridge
- Vembe-Innovation Champions for LED X4



0 100 200 400 600 800 Kilometers

Viability and Validation of Innovations for Service Delivery (VVISDP) – Geographic

Project Name	Objectives
Innovative Technology Solutions for Basic Service Delivery	Demonstration of appropriate innovative technology solutions for improving access and quality of basic services i.e., water resources management, waste management, green and renewable energy solutions, sanitation and connectivity.
Decision Support Tools	Introduction of new decision support tools to support the functioning and performance of municipalities and government departments in the areas of energy, sanitation procurement, spatial planning, human settlements, service delivery, infrastructure, risk and disaster management, health, crime prevention.
Innovation Capacity and Innovation Measurements	Develop and strengthen innovation capacity for the delivery of basic services in municipalities.

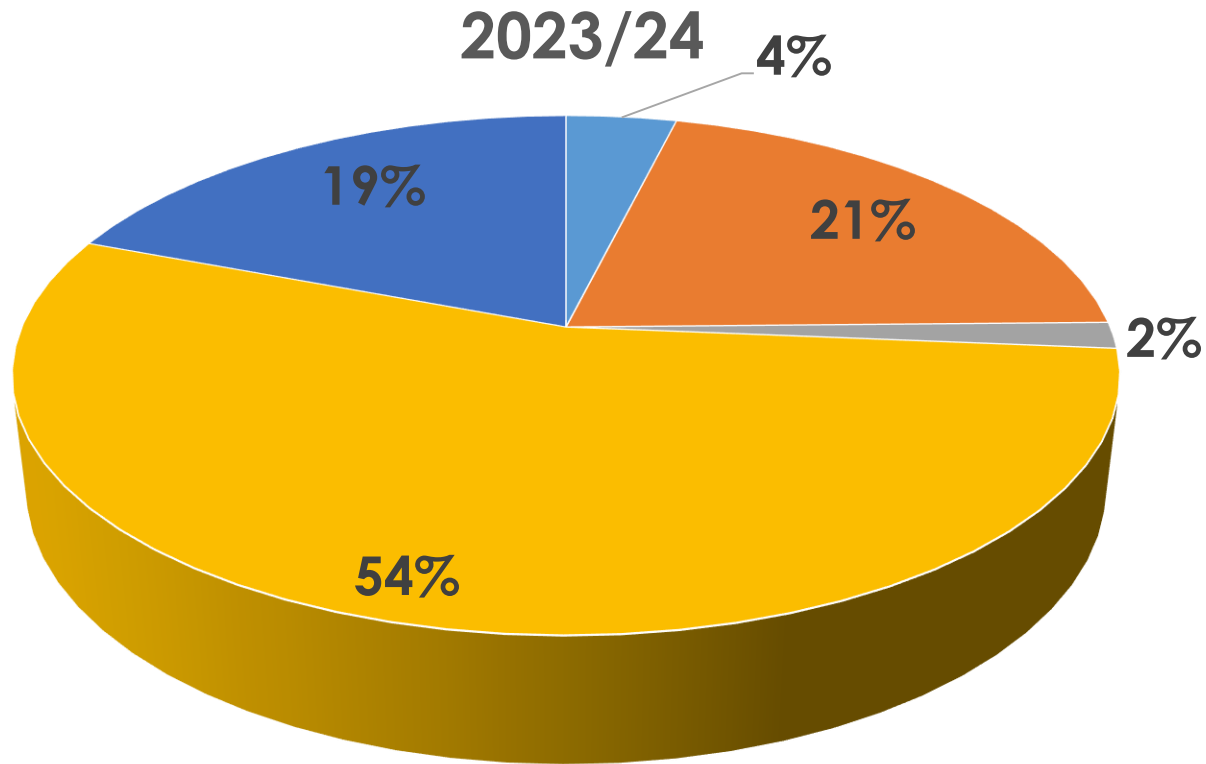
Viability and Validation of Innovations for Service Delivery (VVISDP) – Geographic (cont.)

Project Name	Objectives
Integration of Innovation in the Municipal Policy Environment	Integrate innovation in the delivery of basic services across municipalities through creating an enabling environment.
e-Participation and Policy Modelling Platforms for Municipalities	Development, testing and piloting of a Public Policy Modelling Platform for local government to enable open collaboration in modelling public policies through e-Participation tools and mechanism.
Dialogues, Monitoring & Evaluation, Impacts, Lessons Learned	Enhance the learning and capacity building across the targeted municipalities on technology and innovation management through learning forums and policy dialogues; conduct an evidence-based evaluation approach of the performance of the activity projects against contracted Key Result Areas of individual projects, assess the impact of the activity on govt.

MTEF Allocations per Programme

Programme	Adjusted Appropriation 2022/23	2023 MTEF ALLOCATIONS		
		2023/24 R'000	2024/25 R'000	2025/26 R'000
Administration	352,074	344,062	359,325	375,241
Technology Innovation	1,907,025	2,568,378	2,307,872	1,957,775
International Cooperation and Resources	149,387	149,886	156,568	163,532
Research Development and Support	4,979,152	6,046,004	5,854,545	5,680,480
Socio-economic Innovation Partnerships	1,757,624	1,765,891	1,845,369	1,927,995
Total	9,145,262	10,874,221	10,523,679	10,105,023

2023/24 Budget Analysis per Programme



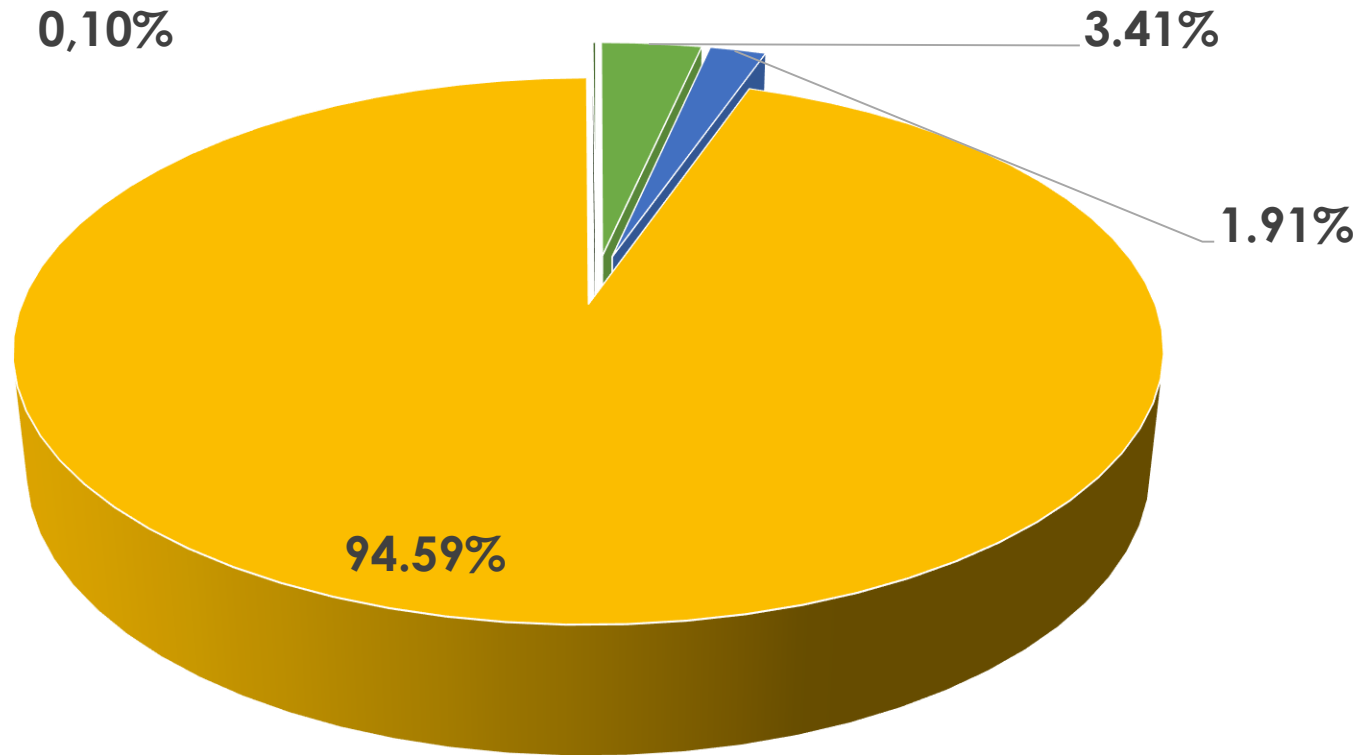
- Administration
- Technology Innovation
- International Cooperation and Resources
- Research Development and Support
- Socio-economic Innovation Partnerships

MTEF Allocations per Economic Classification

Economic Classification	Adjusted Appropriation 2022/23	2023 MTEF ALLOCATIONS		
		2023/24 R'000	2024/25 R'000	2025/2 R'000
Compensation of employees	357,650	370,517	386,794	403,758
Goods and services	222,231	207,452	217,100	227,152
Transfers and subsidies	8,554,102	10,285,840	9,909,232	9,463,413
Payments for capital assets	11,279	10,412	10,553	10,700
Total	9,145,262	10,874,221	10,523,679	10,105,023

2023/24 Analysis per Economic Classification

2023/24



■ Compensation of Employees

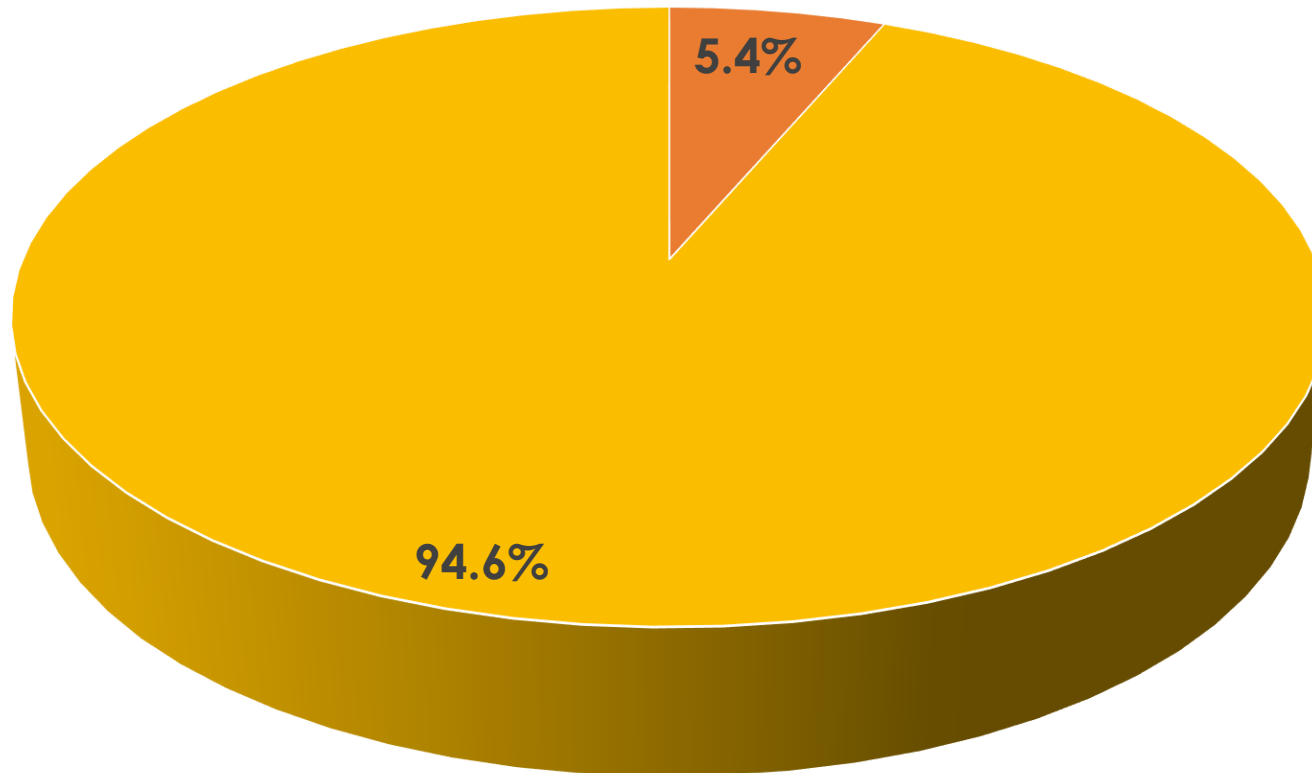
■ Goods and Services

■ Transfers and Subsidies

■ Payments for Capital Assets

2023/24 Percentage of Operational budget vs transfers and subsidies

2023/24



■ Operational budget ■ Transfers and Subsidies

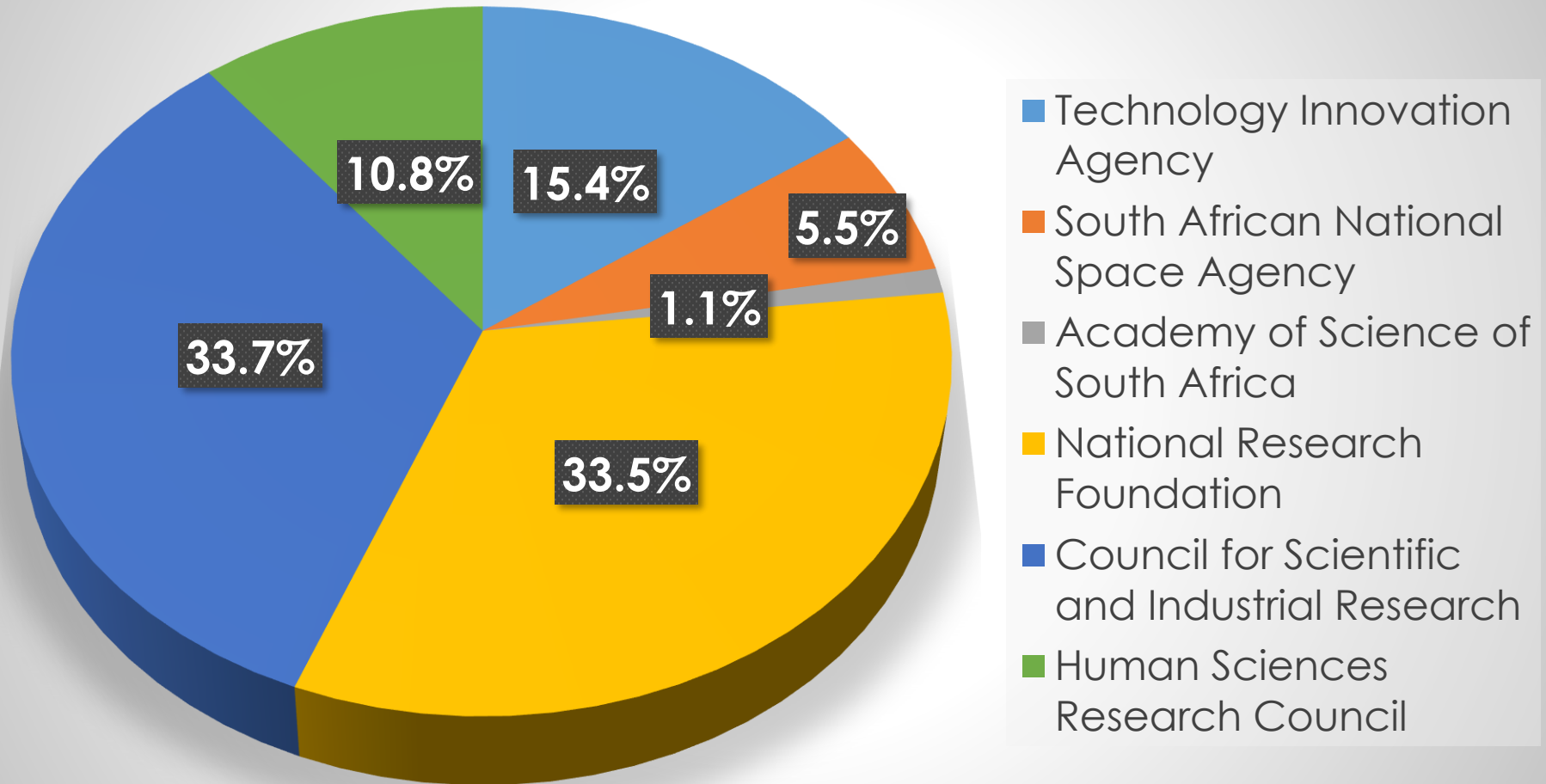
2022 MTEF Allocation to Public Entities

Public Entities	2023/24 R'000	2024/25 R'000	2025/26 R'000
South African National Space Agency	163,063	170,386	178,019
Technology Innovation Agency	460,131	480,795	502,335
Academy of Science of South Africa	33,970	35,496	37,086
National Research Foundation	1,001,295	1,046,051	1,092,914
Council for Scientific and Industrial Research	1,006,119	1,051,303	1,098,401
Human Sciences Research Council	322,332	336,808	351,897
Total	2,986,910	3,120,839	3,260,652

NB: MTEF allocation to public entities comprises of parliamentary grants only.

2023/24 Budget Allocation Analysis per Entity

2023/24 Allocation



2023/24 Infrastructure Projects

INFRASTRUCTURE PROJECTS	PROGRAMME	OUTPUT	2023/24 ALLOCATION
Square Kilometre Array (SKA)	Research Development and Support	<ul style="list-style-type: none"> Contract for 13 additional MeerKAT Antennas. Installation of receivers (ultra-high frequency and L-band) on the 13 additional antennas. 	1 709 307
National Integrated Cyberinfrastructure System (NICIS)		<ul style="list-style-type: none"> Increased total available broadband capacity provided by SANReN annually. Increased data storage capability through DIRISA projects Feasibility study to increase computing capability to 10 Pflops conducted. Graduate master's students in e-science through the National e-Science Postgraduate Teaching and Training Platform. 	294 188
South African Research Infrastructure Roadmap (SARIR)		<ul style="list-style-type: none"> Establishment of 13 large research infrastructure (RI) projects across five scientific domains (Humans and Society; Health, Biological and Food Security; Earth and the Environment; (materials, Manufacturing; and Energy) Implementation of SARIR 	899 583

***Dankie
Enkosi
Ha khensa
Re a leboga
Ro livhuwa
Siyabonga
Siyathokoza
Thank you***

