

2018/19

ANNUAL REPORT

**Presentation to the Portfolio Committee
on Mineral Resources and Energy**

10 October 2019



“A proud entity of the Department of Mineral Resources and Energy”

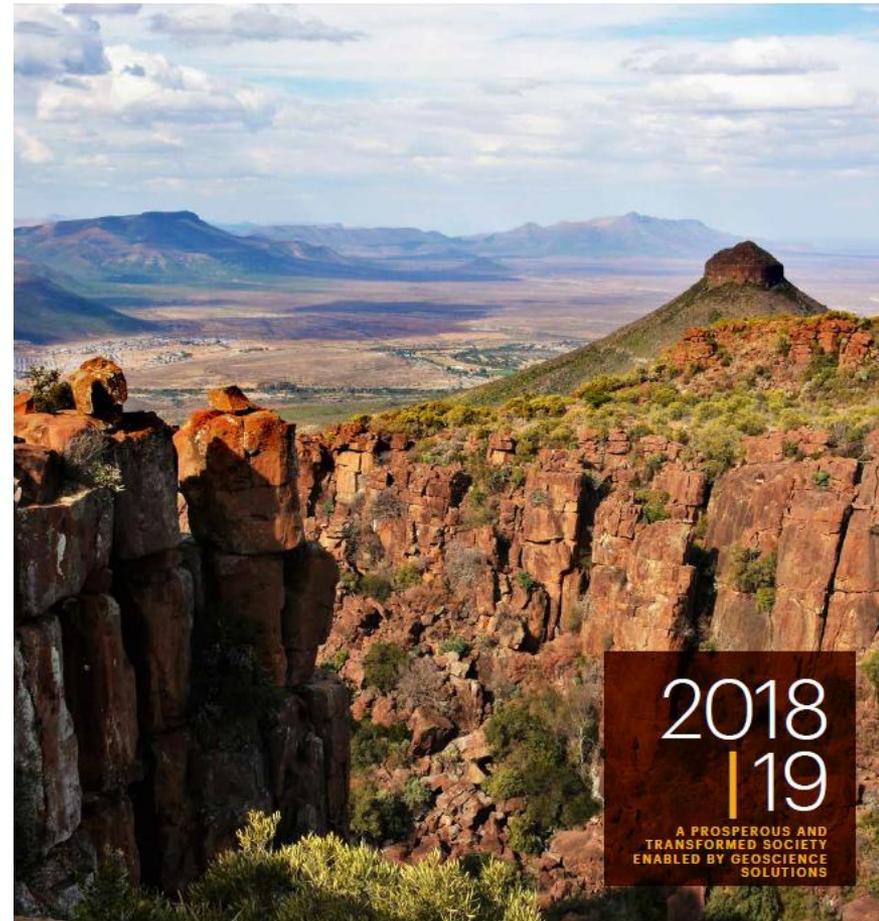


Council for Geoscience

Outline

1. CGS Corporate Performance
2018/2019
2. A selection of organisational
highlights
3. Financial Information
4. Strategic outlook of the CGS
5. Concluding remarks

ANNUAL REPORT



A proud entity of the Department of Mineral Resources and Energy



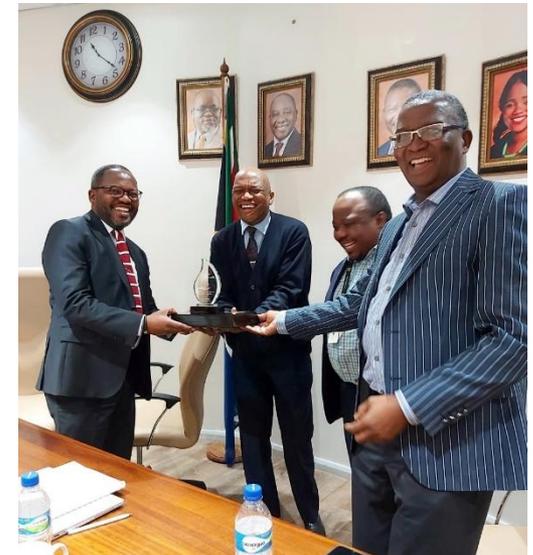
Council for Geoscience

CGS Corporate Performance for 2018/2019



2018/2019 Audit Outcomes

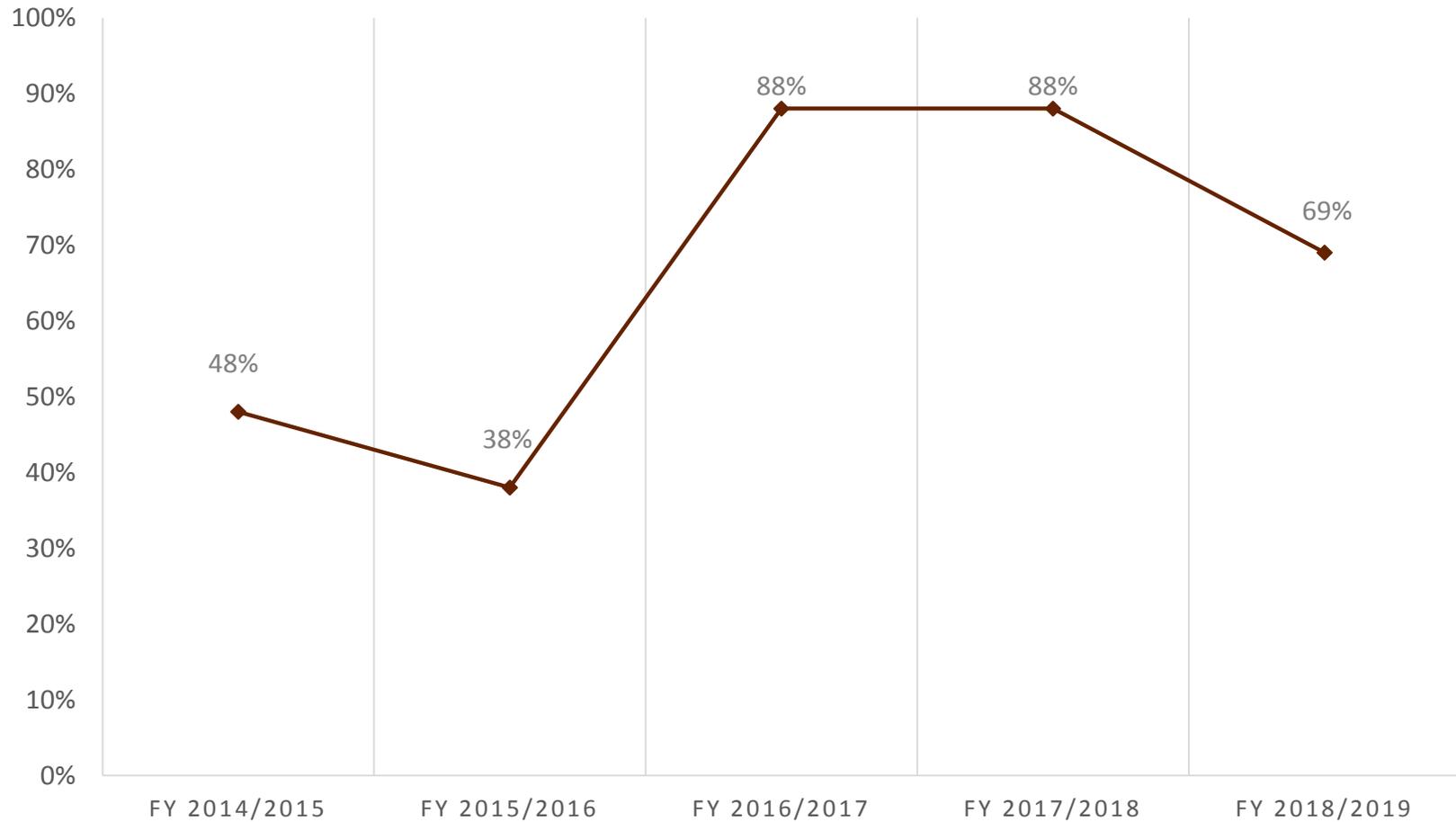
- *“Good governance is the foundation for creating capable State institutions”*
- A Clean Audit Award was obtained for the financial year under review, after 16 consecutive years of unqualified audits.



- Continuous enhancement of internal control measures constitute a critical part of maintaining the new normal.

MTSF cycle performance analysis

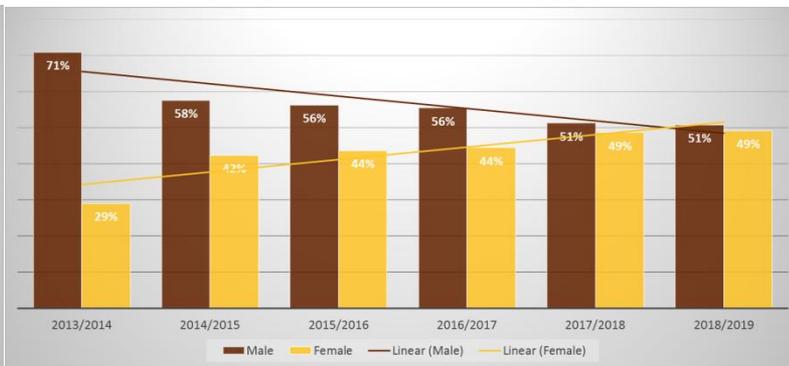
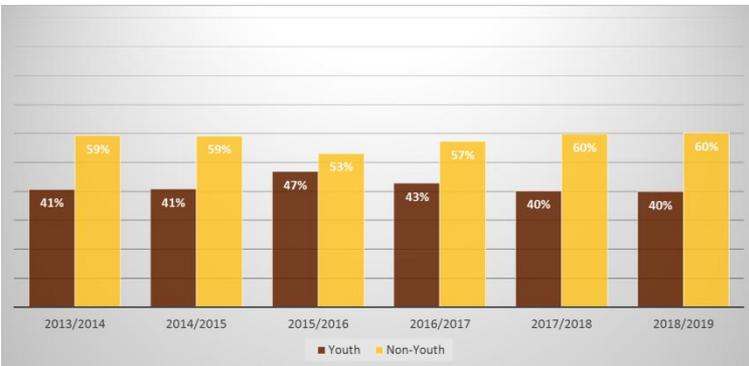
Audited performance



Key performance indicators at a glance.....

Learning and Growth Perspective

Strategic objective	Indicators	Target 2018/2019	Actual 2018/2019
An Empowered, Transformed, Motivated and Capacitated Workforce	Level of staff satisfaction	75%	65%
	Net staff turnover rate	5%	5.47%
	Training expenditure (Ratio of training expenditure to leviabale amount of payroll)	2%	1.46%
	Staff with disability	1.25%	1.59%
	EE statistics (Ratio Male:Female)	53:47	49:51



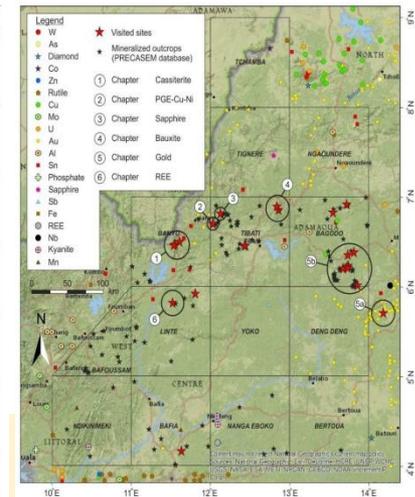
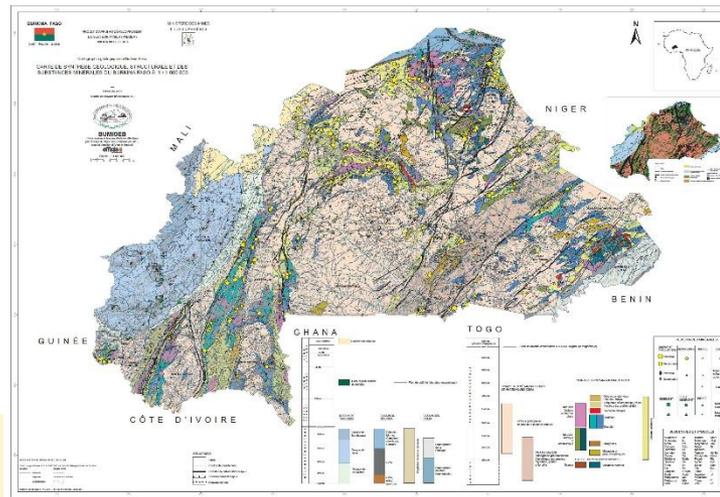
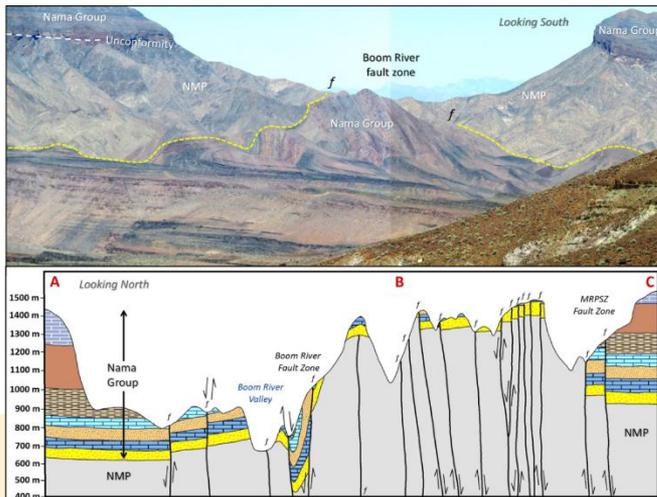
Key performance indicators at a glance...

Systems Perspective

Strategic objective	Indicators	Target 2018/2019	Actual 2018/2019
Organisational Effectiveness and Efficiency	Implementation of the planned activities for the year for Laboratory ISO 17025 accreditation	100%	45%
	Organisational wide implementation of the planned activities for the year in terms of ISO 9001 certification	100%	83%
	Integrated ICT systems implemented as per business requirements	60%	60%
	Audit qualifications	0	0
	Value spent on preferential procurement as a proportion of total spend on procurement	76%	67.46%

Financial Perspective

Strategic objective	Indicators	Target 2018/2019	Actual 2018/2019
Financial Sustainability	Government grant	R393.9m	R426.6m
	Revenue from collaborative activities/partnerships	R24.2m	R30m



A selection of organisational highlights



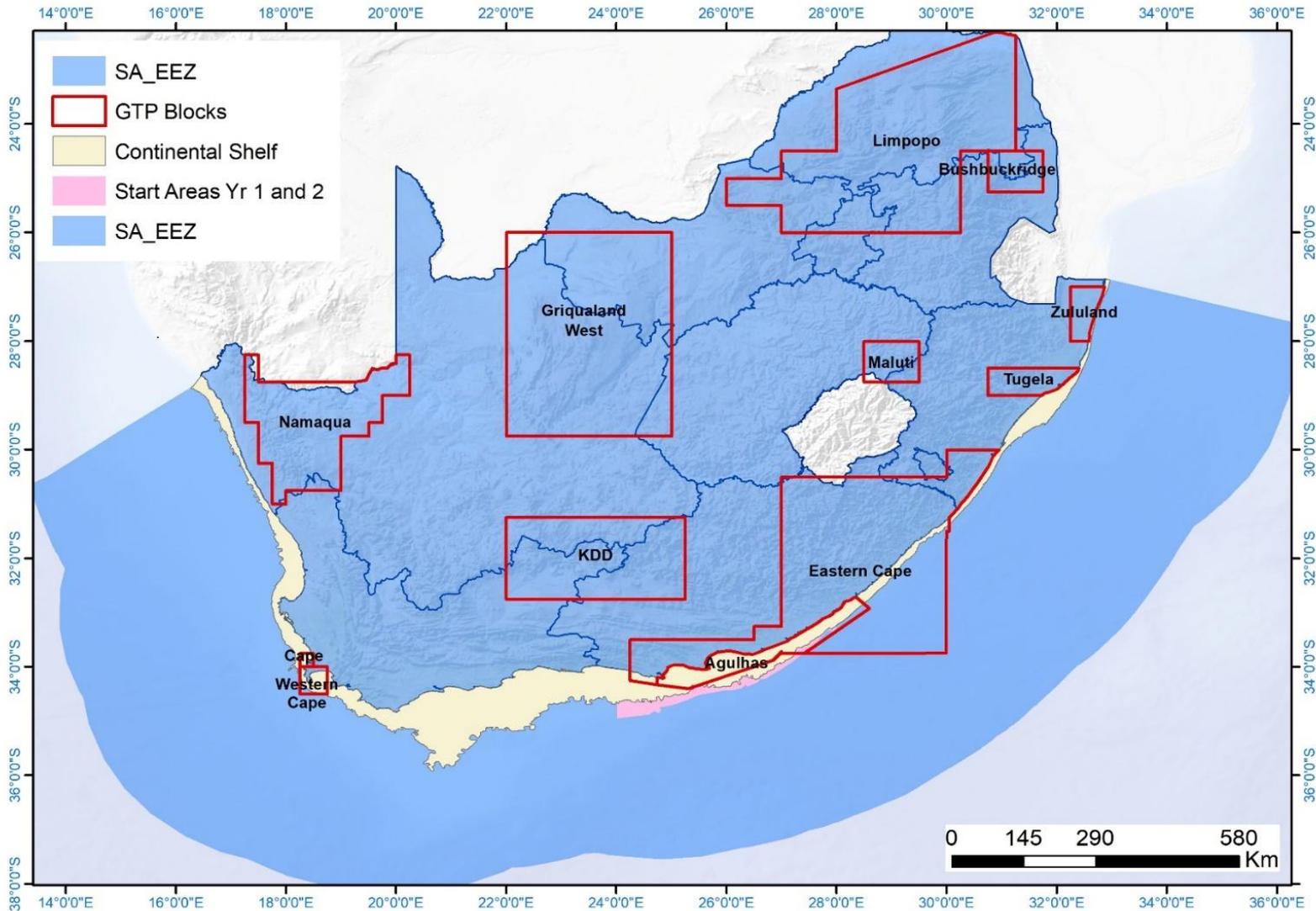
The Integrated Multidisciplinary Geoscience Mapping Programme (IMMP)

INTEGRATED AND MULTIDISCIPLINARY GEOSCIENCE MAPPING PROGRAMME: 2018–2021 MATRIX				
ND imperative: Economic growth	ND imperative: Environment and health	ND imperative: Innovation	ND imperative: International relations	
1. Geoscience for mineral and energy resources	2. Geoscience for infrastructure and land use	3. Geoscience for health, groundwater and the environment	4. Geoscience innovation	5. Geoscience diplomacy
CUSTODIANSHIP OF ALL GEOSCIENTIFIC INFORMATION IN SOUTH AFRICA				
Onshore and offshore geoscience research and mapping for current and future generations Modelling geological environments and mineralising systems for mineral and energy resources	Geotechnical mapping and vulnerability investigations (sinkholes, mine subsidence, coastal erosion and landslides) Seismic susceptibility investigations (mine seismic hazard assessment) Optimisation of land use (food security, geoheritage and geotourism, physical infrastructure)	Environmental geoscience research (monitoring and mitigating the impact of geology and mining activities on health and the environment) Hydrogeological research and modelling	Application of artificial intelligence in geoscience Cultivating geoscientific innovation and novelty	Geoscience collaboration and global standards International geoscience policy and governance OAGS Secretariat

Value proposition - the IMMP

- Economic growth from **increased investment** in development of mineral and energy resources
- Improved ocean **governance and data management** with increased environmental stewardship – the blue economy (Oceans Phakisa)
- Sustainable **food security**
- Improved predictive capability of **geohazards** (sinkholes, landslides, earthquakes)
- Improved infrastructural, **spatial planning and landuse**
- Safer **water** and **environment** for communities
- An instrument of deployment of the **Regional integration and foreign policy** – geoscience diplomacy

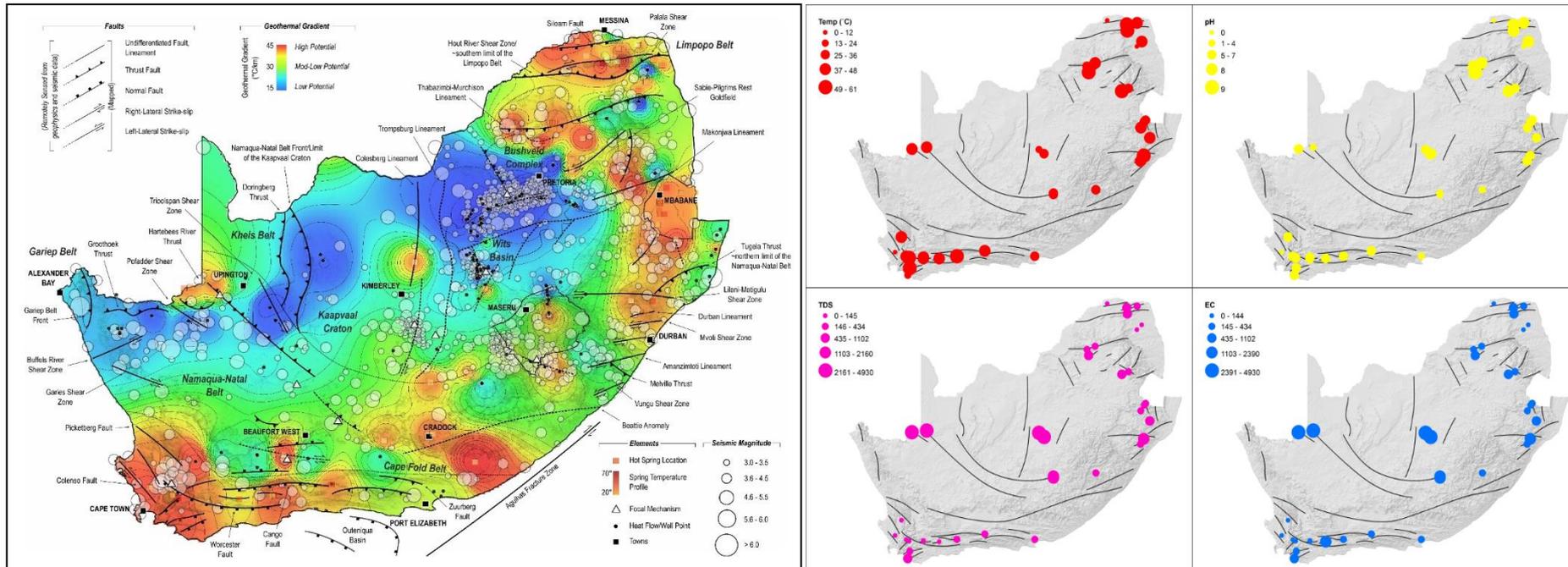
Focus areas for the IMMP in South Africa



Geoscience for minerals and energy resources projects

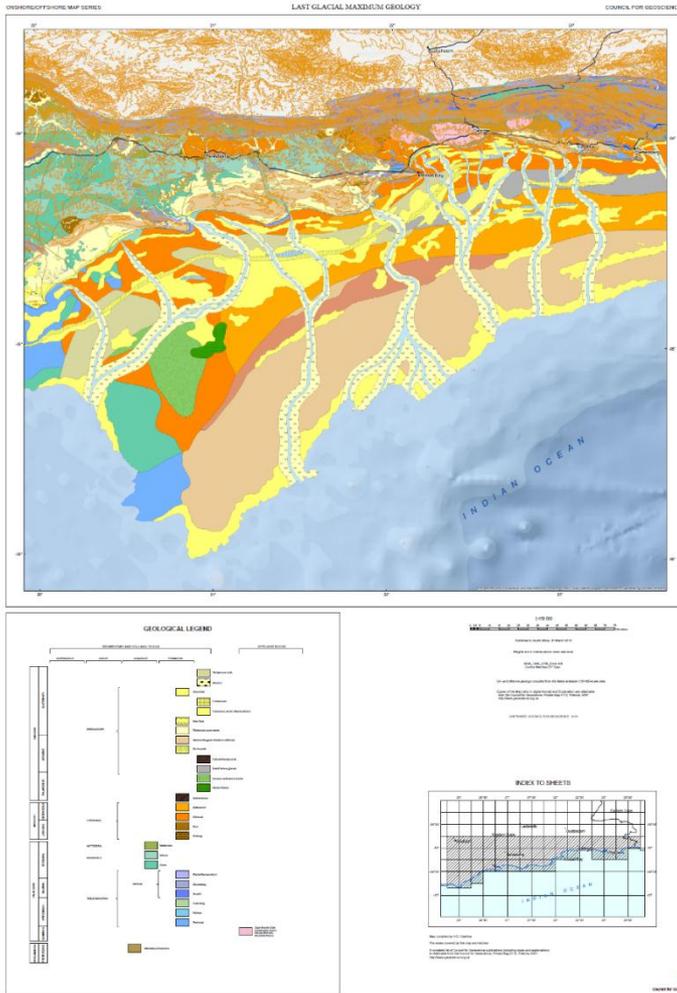
Geothermal Energy Potential of South Africa

- Regions that show potential geothermal energy resources have been identified.
- Further characterisation of high-potential areas is underway.



Geoscience for minerals and energy resources projects

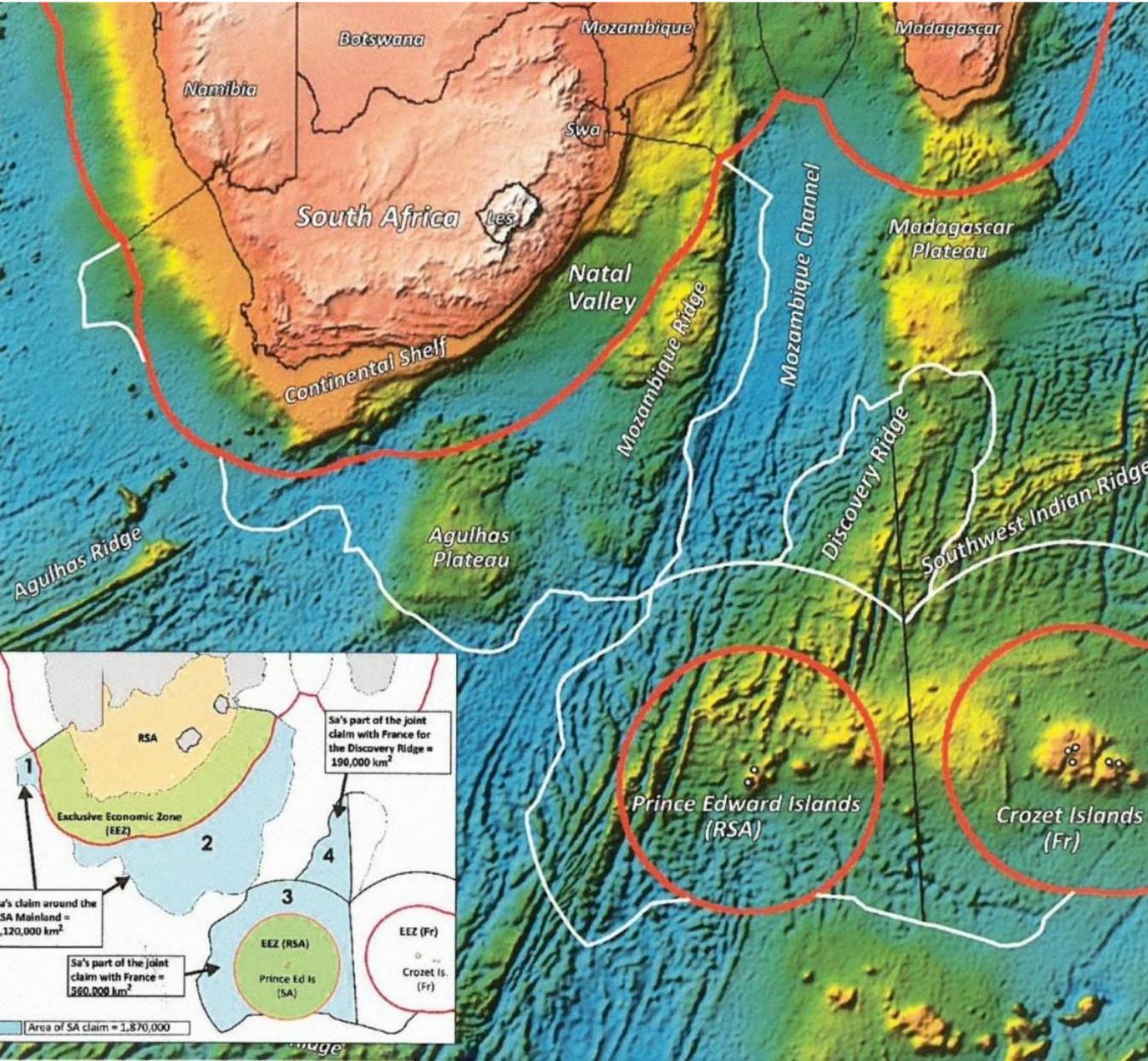
Marine Geoscience Programme



- -The South African Near Shore Mapping Programme aims to boost the **Blue Economy**
- The near and offshore mineral characterisation, investigation renewable energy sources, petroleum production, study sea-level change and global climate, assess geohazards and contribute toward ocean governance.
- Support the Exclusive Economic Zone (EEZ) extension shelf claim from the United Nations (UN).

“The CGS’s first onshore-offshore geological map along Mossel Bay is key to unlocking the Blue economy of South Africa”

South African EEZ (PASA image)



The offshore territory is **larger than the onshore landmass**, and will be more than doubled if the extended shelf claim application is secured



Geoscience for minerals and energy resources projects

Limpopo Greenstone Belt Mapping Project

- Maps the orogenic gold mineralisation system, with prospects to support economic growth in the historically underdeveloped area.
- Deliverables include:
 - Six 1:50k geological maps, integrated with regional soil geochemistry and magnetotelluric geophysical surveys
 - Delineation of an extension of the Schiel Alkaline Complex and a newly observed granite body was illuminated.



Geoscience for minerals and energy resources projects

Central KwaZulu-Natal Geoscience Mapping Project

- A regional mineral potential investigation conducted in Central KwaZulu-Natal area.
- This work has correlated lithological horizons in the Nkandla area with the gold-bearing placer conglomerates of the Dominion Group in the Witwatersrand Basin.
- An example of upside prospect for a de-risked exploration, catalysed by the investment of the State in pre-competitive geoscience knowledge.



Geoscience for infrastructure and land use projects



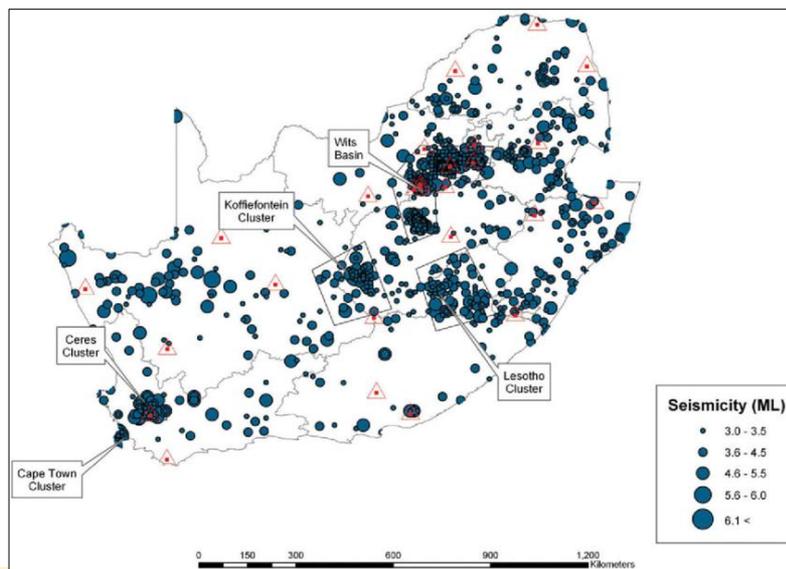
Geotechnical investigations for low-cost housing developments in Northern Cape

- The CGS is supporting the Northern Cape Department for Co-operative Governance , Human Settlement and Traditional Affairs (COGHSTA).
- The geotechnical investigations on dolomitic occurrences executed to support programmes such as the Mining Town Revitalisation Programme and the Land Restitution Programme.

Geoscience for infrastructure and land use projects

Seismic Network Monitoring and Maintenance

- There are **120 seismic stations** installed nationwide
- Increasing occurrence of seismic **events** recorded
- **A cluster network** installation around deep gold mining areas installed and monitored in collaboration with the **Mine Health and Safety Council**
- The **seismic hazard mapping** or modelling for infrastructure development and mine safety



Geoscience for health, groundwater and the environment projects

Mine Water Management Programme

- On behalf of the DMRE, the CGS is implementing the Mine Water Programme to address challenges in the environment which are caused by contaminated mine water to promote environmental stewardship
- The CGS also plays an important role in supporting the DMRE through its participation in the Government Task Team on Mine Water and Mine Closure
- The CGS undertook a risk assessment and recommended solutions regarding the impact of small-scale mining in the Van Rhyn area



Management of State contingent liabilities with respect to Derelict and Ownerless (D&O) mines in South Africa

The aim of this project is to support the DMRE in carrying out its mandate in view of developing tools to measure minimum acceptable remedial measures and implementation programmes to address the impacts of D&O mines.

Geoscience for health, groundwater and the environment projects

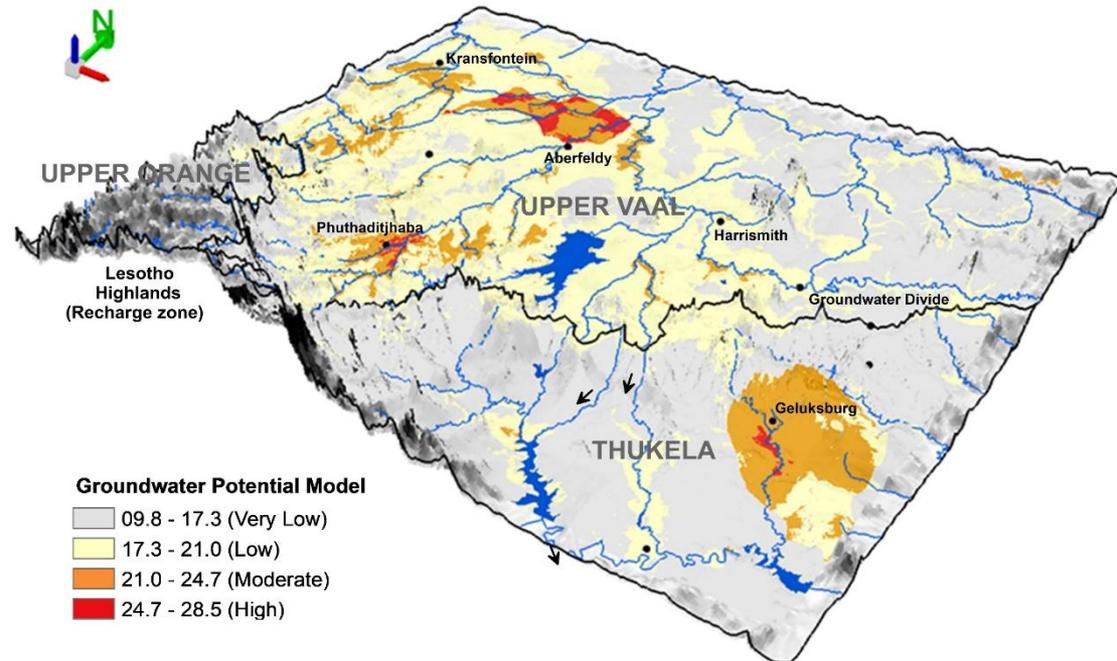
Maluti a Phofong project

The project aims to conduct geotechnical, geohydrological and erosion studies. All the datasets will be integrated to develop infrastructure and geo-environmental management plans for Maluti a Phofong.

Geoscience innovation

The CGS is applying principles of artificial intelligence to assess ground water vulnerability, characterising sinkholes and understanding mine seismicity.

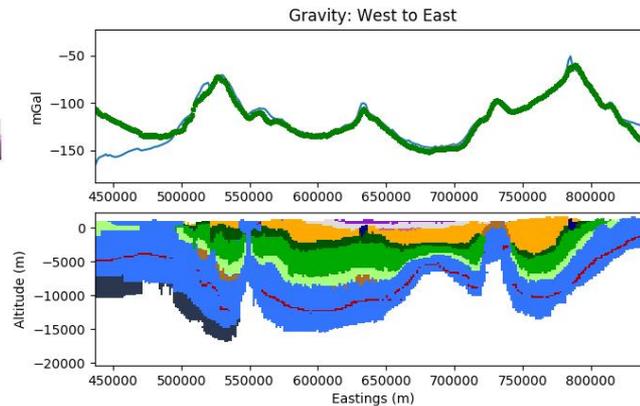
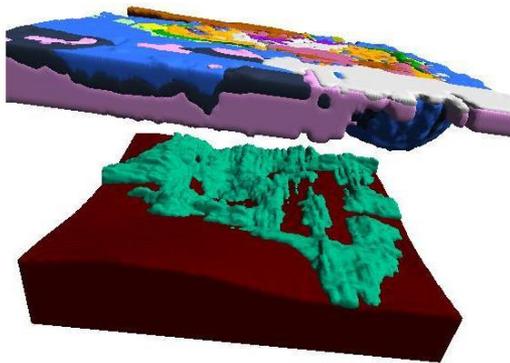
The water potential maps over Maluti area have been produced through applications of AI.



Geoscience innovation programme

PyGMI

PyGMI (Python Geophysical Modelling and Interpretation) is an open source software developed to create high resolution 3D models. It also incorporates a variety of interpretation tools, including some processing capability for seismic data.



Groundwater - Artificial Intelligence Program
File Help About

Artificial intelligence applications in geoscience

Project aims to: develop a multidimensional AI system that can be used to address societal issues such as geohazards (subsidence prediction, seismic analysis and groundwater mapping).

KNOWLEDGE DISCOVERY IN GROUNDWATER STUDIES

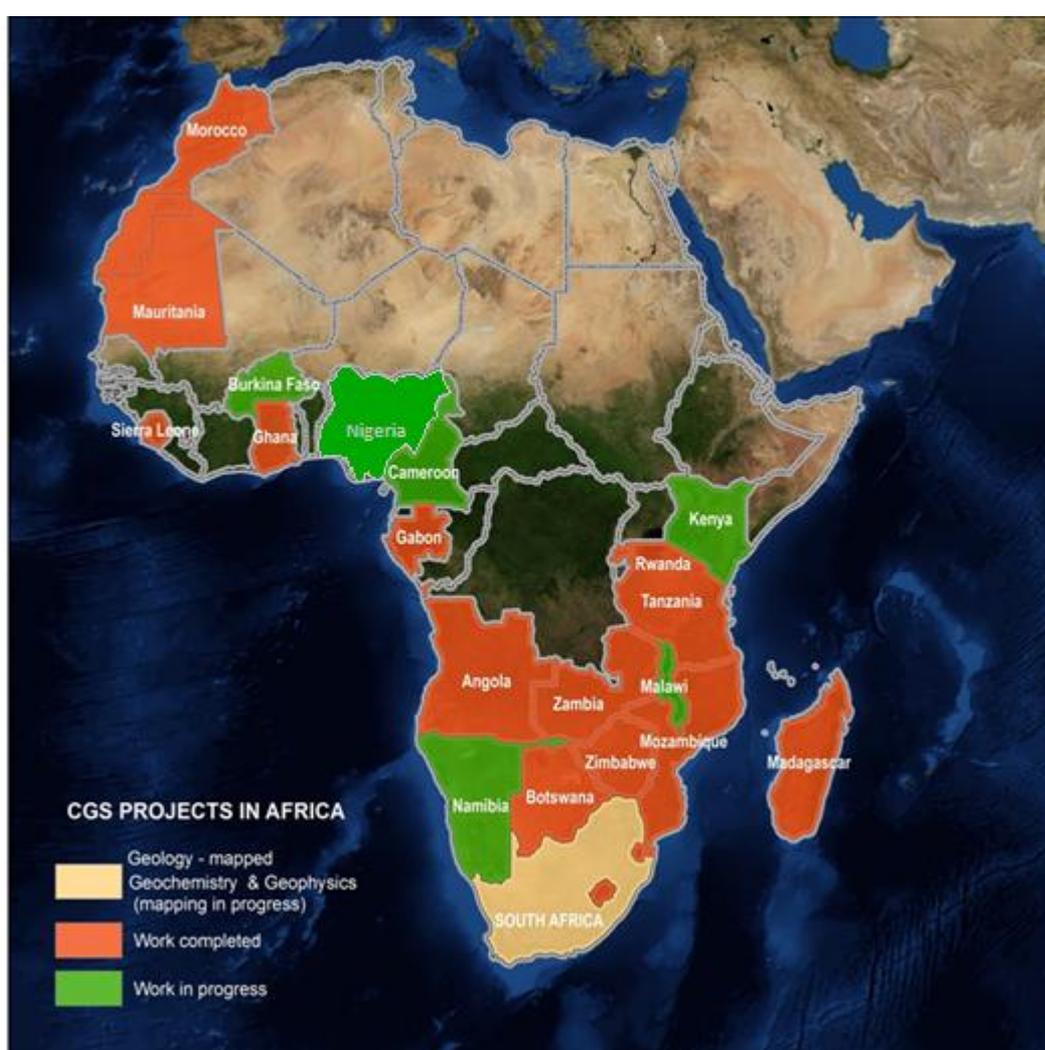
Iterative software program for assessment of groundwater potential at a regional scale and prediction of future minewater quality using historic information at a mine site.



GROUNDWATER POTENTIAL MAPPING

MINE WATER PREDICTION

Geoscience Diplomacy programme: African footprint and other collaborations by the CGS



Footprint over 19 African Countries

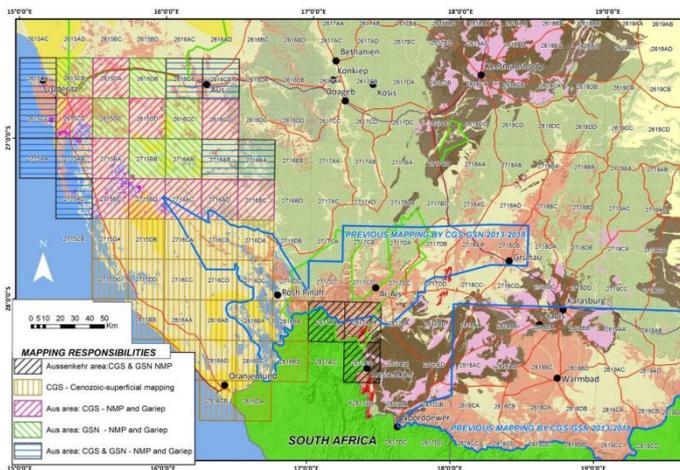
- **Geoscience Mapping** (e.g. geochemical, geological, geophysical, seismological, metallogenic, hydrological and mineral resource assessment)
- **Institutional Reform**
- **Map Compilation and Production** (GIS, Cartography)
- **Supervision of World Bank Projects**

Other Collaborations:

- Canada (GSC)
- USA (USGS)
- France (BRGM)
- Japan and Germany (ICLDP)
- Germany (BIC)
- African Co-Operations

Geoscience Diplomacy programme....

- Transboundary geological mapping in countries such as **Namibia** and **Malawi** generate fundamental geological data to support economic development, and to train and develop local geologists and students.
- SANSN, administered by the CGS, makes an important contribution to the preparatory commission for the Comprehensive Nuclear Test Ban Treaty Organisation (CTBTO), which facilitates global cooperation in monitoring nuclear weapon testing.



The CGS assumes a NKP status

The CGS was declared a **National Key Point** by the Minister of Police (Mr Bheki Cele), after careful consideration of its role in the Public.

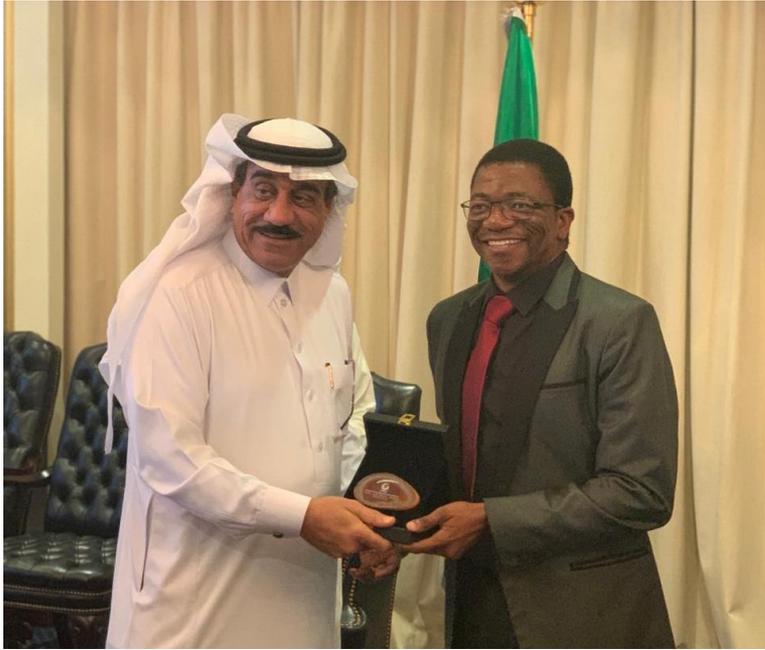


Collaboration with the SANDF



The CGS is at advanced stages of negotiating an MoU with the SANDF and the SAN to collaborate on areas of mutual interest and benefit

Furtherance of collaboration with Saudi Arabia



Furtherance of collaboration with eSwatini



Consultations with communities – Eastern Cape



Consultation with communities - South Coast



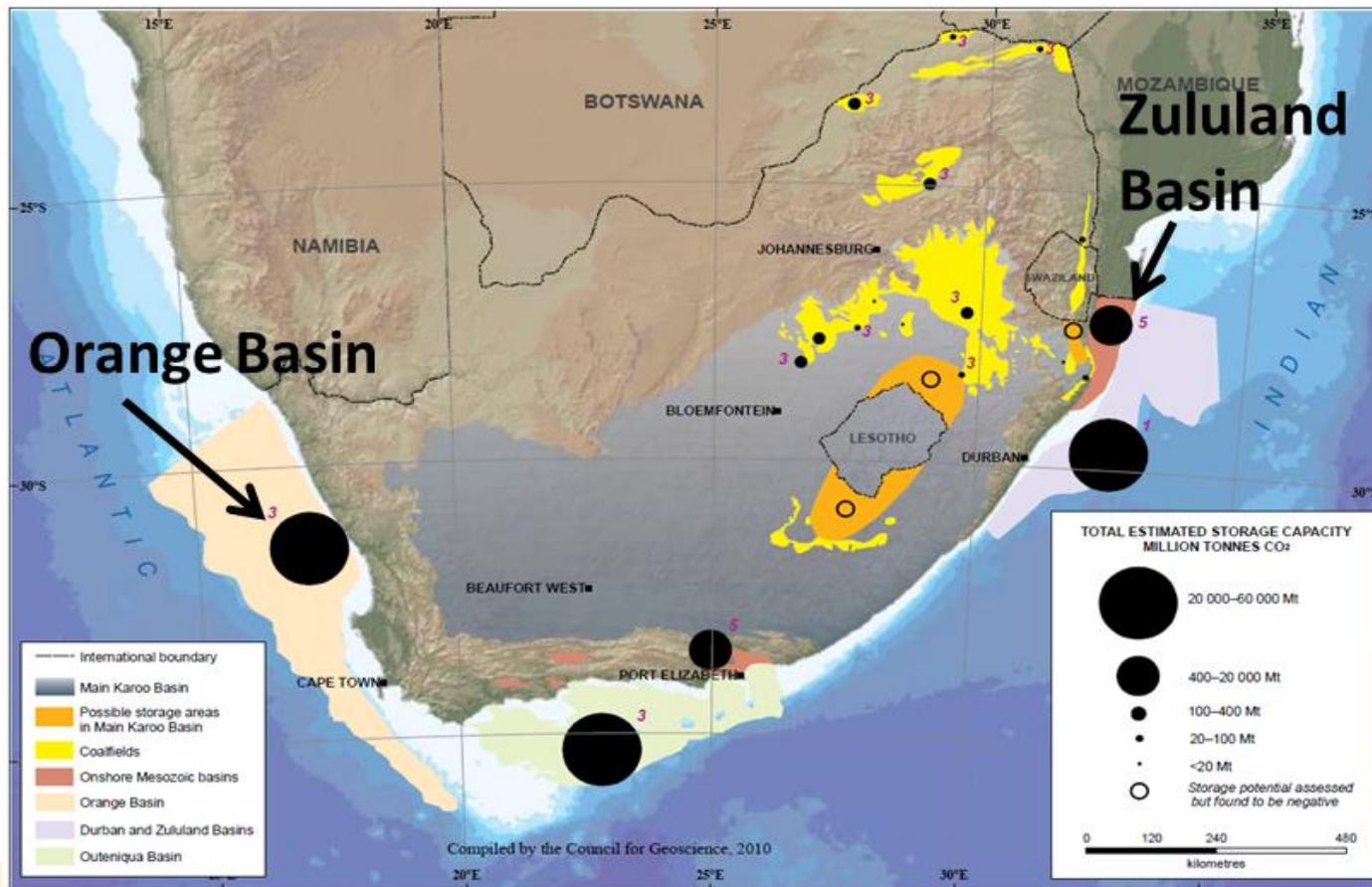
Fossil collection, our national heritage

- Fossils are part of the National Estate
- CGS has over 10 000 fossil specimens (largest collection after Iziko Museums in Cape Town) which are unique globally and represent different geological eras (~600 – 350 Ma).
- These fossils are critical in understanding multicellular life, evolution of life, global biogeography, environmental and ecological change, indigenous knowledge systems and establishing biostratigraphic frameworks in South Africa.
- Cutting edge palaeontological research the CGS is currently looking into African perspectives on:
 - ❖ Deep-time climate change (the use of the past to prepare for the future),
 - ❖ Evolutionary development of life and Breaking down racial/cultural/political barriers.
 - ❖ Application of palaeontological material in hydrocarbon exploration, biostratigraphy, education and Geo/palaeoheritage and tourism



Collaboration with SANEDI on Carbon Capture and Storage Options for South Africa

This project (a collaboration with SANEDI) aims to ascertain the carbon capture and storage potential in South Africa, primarily focussed within the Zululand and Orange Basins.



Financial Information



Audited Actuals FY 2018/19 and Budget FY2019/20 – FY2020/21

Income/Funding Model				
Income (Rands)	2018/19 Budget x 1000	2018/19 Actuals x 1000	2019/20 Budget x 1000	2020/21 Budget x 1000
*Government grant - Baseline	199 335	199 335	198 539	208 357
Government grant - MTEF	301 779	227 280	433 279	227 377
Sales and contracts	24 200	29 422	26 620	29 282
Sundry income	3 694	27 770	3 878	4 072
TOTAL INCOME - A	529 008	483 807	662 316	469 088

*There is a downward trend in the government grant

Audited Actuals FY 2018/19 and Budget FY2019/20 – FY2020/21

Expenditure (Rands)	2018/19 Budget x 1000	2018/19 Actuals x 1000	2019/20 Budget x 1000	2020/21 Budget x 1000
Personnel costs	244 919	290 763	309 028	330 721
Bursaries	3 367	3 790	3 704	4 074
Commercial project costs	10 890	20 775	11 979	13 177
Overheads and operating costs	104 980	169 565	195 107	105 616
SUBTOTAL - B	364 156	484 893	519 818	453 588
(LOSS) A-B	-	(1 086)	-	-
Budgeted Capital Expenditure (vehicles; equipments;etc)	164 852	*28 674	142 498	15 500
TOTAL EXPENDITURE	529 008	484 893	662 316	469 088

- Balance Sheet

Analysis of Government Grant Allocations from FY2018/19 to FY2021/22

ITEM	2018/19	2019/20	2020/21	2021/22
Baseline allocation	R199.3m	R198.6m	R208.4m	R220.8m
Water Ingress Project	R30.7m	R27.5m	R29.0m	R30.6m
*Shale Gas	R27.6m	—	—	—
Expanded Public Works Programme :Derelict and ownerless mines	R1.0m	—	—	—
Economic Competitiveness and Support Package (ECSP)	R90.0m	R188.0m	R198.3m	—
Digital Information System; equipment and facilities	R90.0m	—	—	—
Analytical and Research work for the Geoscience Laboratory	—	R188.0m	R198.3m	—
*Mine Rehabilitation	R57.3m	—	—	—
Total Government Grant (** 2019 MTEF DMR Indicative allocation letter 20 December 2018)	R405.9m	**R414.1m	**R435.7m	**R251.4m

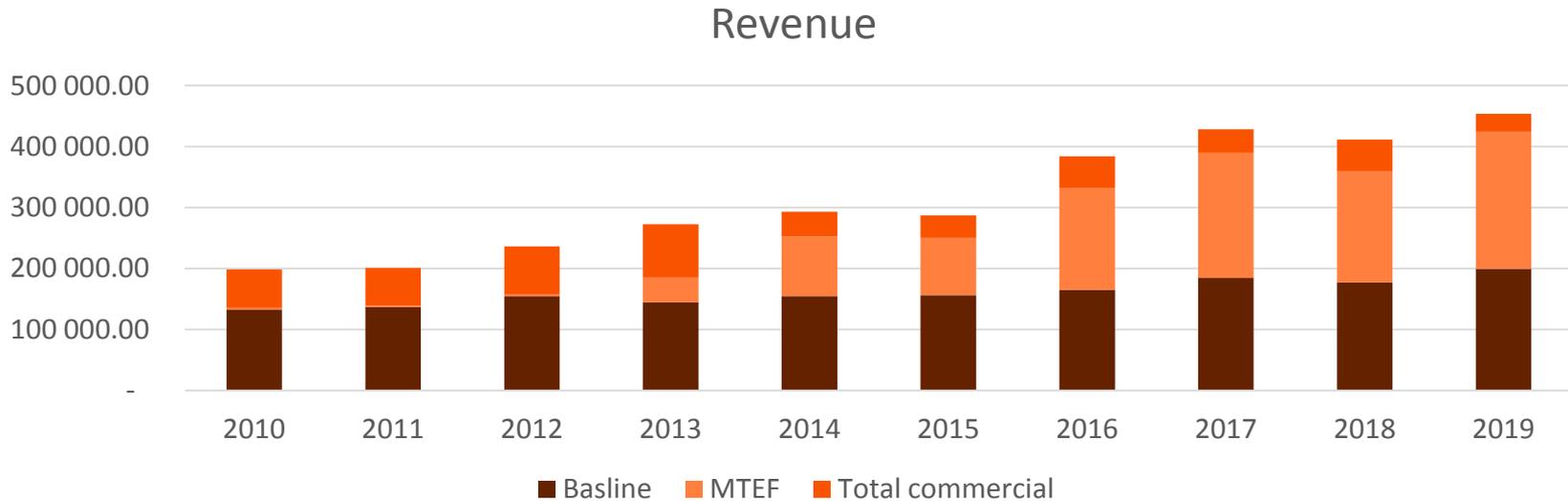
*The Shale gas and D&O funding has ceased.

National Treasury Budget Reductions

	R'000	R'000	R'000	R'000
	Actual 2018/2019	Budget 2019/2020	Budget 2020/2021	Budget 2021/2022
Baseline Reductions				
Baseline allocation	206 938	218 526	230 544	229 261
Baseline Reduction	(7 603)	(19 987)	(22 817)	(8 493)
New Baseline	199 335	198 539	208 357	220 768

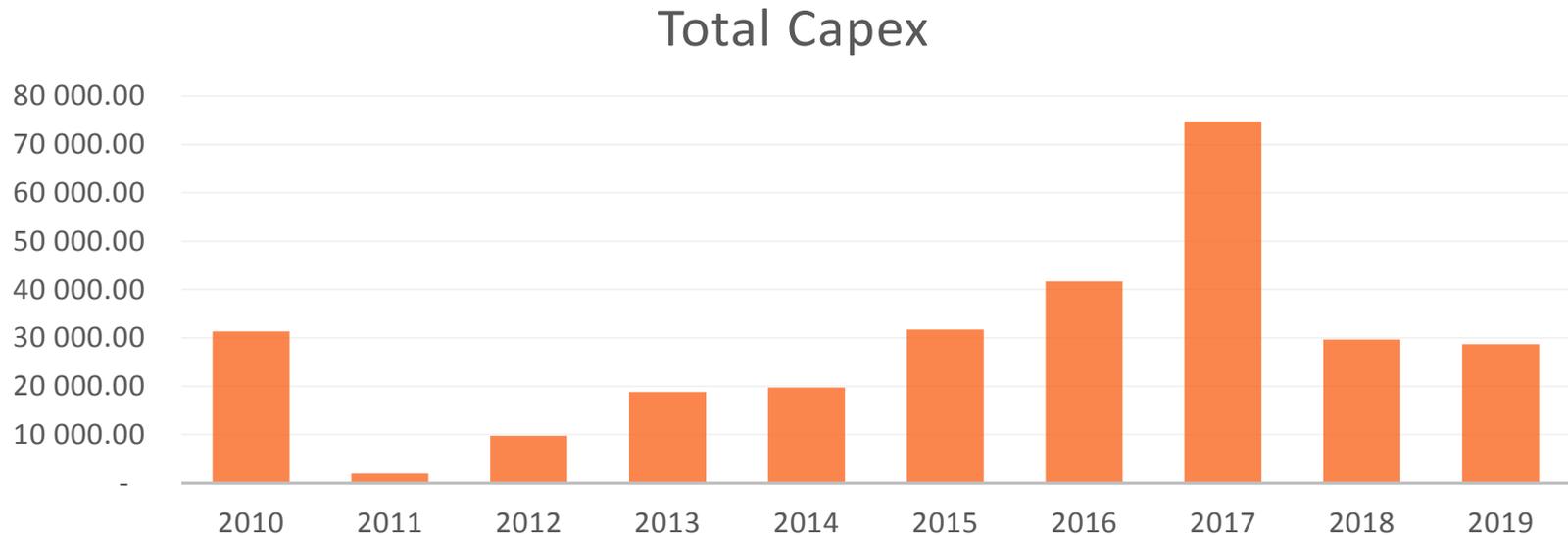
- **Proposed budget reductions of 5, 6 and 7 per cent from the 2020/21 financial year to the 2022/23 financial year respectively**

Financial Sustainability



- There has been no real growth in the baseline grant over the period. The marginal increase in the grant is meant to address inflation. Baseline revenue has increased with an average of 4 % over the period.
- MTEF revenue increased over the period due to additional projects. Funding to the amount of R386m has been allocated for the 2019/20 and 2020/21 financial year for the Integrated Multidisciplinary Mapping programme and no further funding has been allocated.
- There is a need to secure continued funding in order to sustain this programme. As a result of the decline in MTEF funding, business development is underway to increase Commercial revenue.

Financial Sustainability, continued



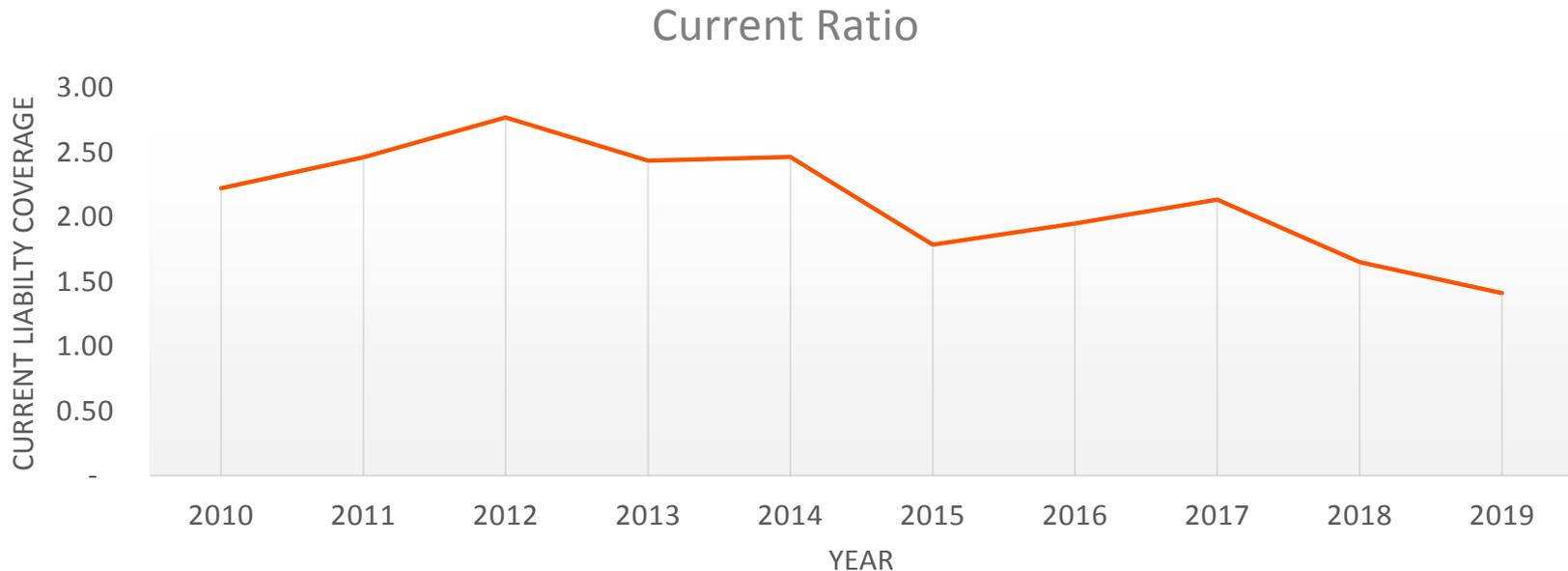
- A capital renewal plan is developed annually to address the infrastructure requirements.
- R142m committed to be spent in the 2019/20 financial year on Digital Information Systems; Equipment; Building and Laboratory Infrastructure and vehicles.
- The aging research infrastructure of the CGS is of great concern to the organization and attention is given to the replacement of infrastructure.

Financial Sustainability, continued



A steady balance sheet position has been maintained over the last 10 years and total assets have increased by an average of 7% over the period.

Financial Sustainability, continued



The CGS is in good financial standing in the short term. This means that the CGS will meet its current financial obligations as they become due. There is however concern to this regard in the long term.

Financial Sustainability, continued

- Based on the above the CGS is able to continue its current level of operations in the short term.
- Additional baseline grant funding is required for long term sustainability and the implementation of the IMMP.
- R300 million Baseline adjustment or R1.7 billion for the IMMP over the next MTEF period has been requested.
- Commercial/Collaborative revenue is required at a healthy balance, not to delay the implementation of the IMMP , but to augment the Government grant investment.

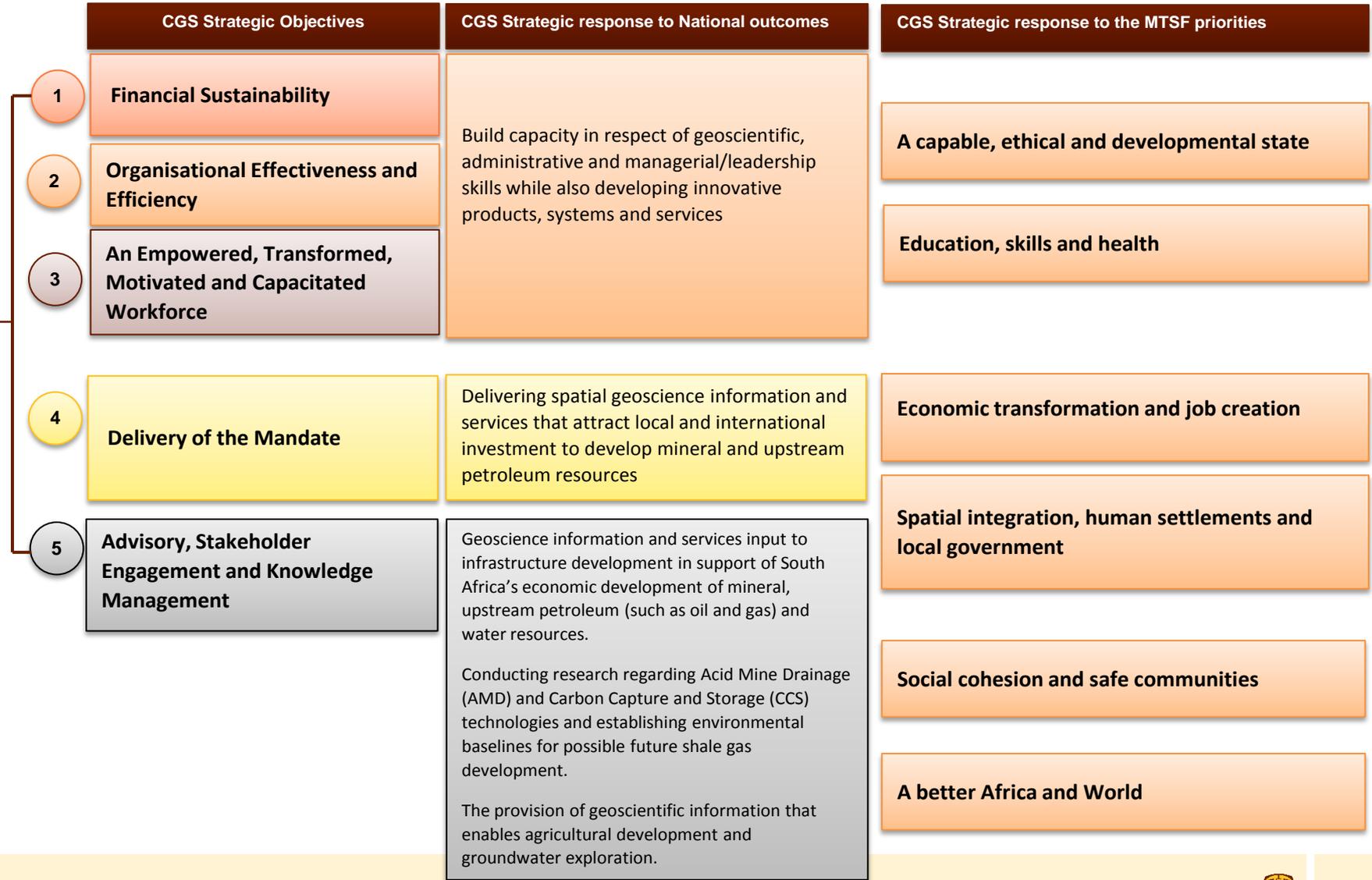
Strategic Outlook of the CGS



Strategic Outlook of the CGS

Strategic Outcome Oriented Goals of the CGS

A prosperous and transformed society enabled by geoscience solutions



Strategic Outlook of the CGS....

- Digitally migrate all geoscience data
- Facilitate growth of the exploration activities in SA to secure a minimum of 5% of the global exploration budget
- Catalysing the blue economy development, in line with the Oceans Operation Phakisa
- Contribute to an improved carbon capture technologies (for the reduction of greenhouse gas emissions)
- Geoscience research that contributes to food security, infrastructure development, water and environment.
- Improve African collaborations
- Grow scientific skills to execute the IMMP
- Embrace applications of the 4IR and AI in geosciences



Strategic challenges confronting the CGS

1. Sustainable funding model
2. Overlap and Duplication of geoscience initiatives in a constrained funding environment
3. Higher percentage of retiring experienced specialist scientists, which result in a huge gap in geoscience knowledge and skills to implement IMMP



Concluding Remarks

“CGS Vision: A prosperous and transformed society enabled by geoscience solutions”

CGS’s Short-term and Long-term interventions

- Secure a long-term sustainable funding model for the CGS
- Optimise the contribution of CGS to National Developmental imperatives & MTSF
- Create a critical mass of young, diversified World Class geoscientists at the CGS
- Give tangible expression of geosciences to addressing societal challenges
- Find a healthy balance of implementing the mandate and executing income generating projects
- Produce innovative geoscience products for commercial and knowledge purposes.
- Continue collaborations with key stakeholders.

THANK YOU



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