



CSIR Annual Report 2022/23

Presentation to
the Parliamentary Portfolio Committee on
Higher Education, Science and Innovation

Friday, 20 September 2023



science & innovation

Department:
Science and Innovation
REPUBLIC OF SOUTH AFRICA



Chairperson's Overview

The work of the CSIR is underpinned by its **mandate** and a **renewed focus** of contributing to **industrial development**, making **impact in government** and remaining relevant whilst securing **long-term growth** and **sustainability** for the organisation.

In the past year, the CSIR has performed admirably in delivering on its **mandate** and **commitment to the shareholder**. About **90%** of its KPIs for the 2022/23 reporting year were met or exceeded.

Good Corporate Governance remains a major priority across the organisation, as a result the CSIR was rewarded with a **clean audit outcome** from the AG.

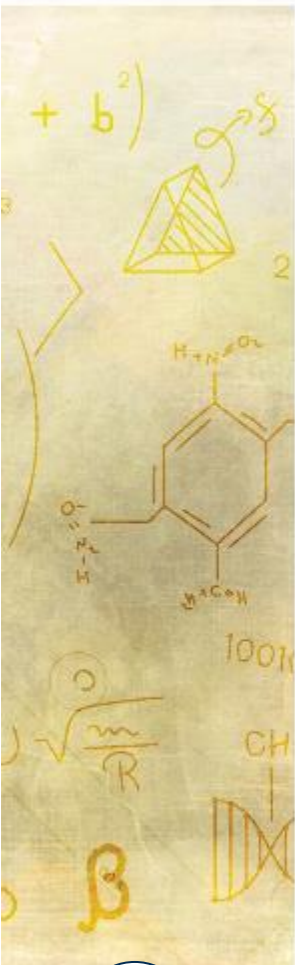
Our challenges remain the **slow economic growth**, which is putting a significant amount of pressure on our turnover, limiting the **growth of private sector income and impact**.



Energy security poses a threat to our **operations** and has **increased the cost of doing business**.

Building on the strong culture of **performance** and **governance**, the new Board has committed itself to supporting the organisation make an even **greater impact** particular at grassroots level and with **SMMEs**.

Furthermore, the CSIR is well positioned to **attract** more opportunities and **address problems** in the **continent**.

Presentation outline



-  CSIR mandate and strategic focus
-  Performance against set targets

The background features a textured, greyish-blue surface with several horizontal lines. On the left, there is a black and white line drawing of a tree with many branches and leaves. On the right, there is a colorful illustration of a plant with yellow and orange flowers and green leaves. In the top right corner, there are some faint chemical formulas: H_2O , H , and Cu .

CSIR MANDATE AND STRATEGIC FOCUS



CSIR mandate

“The objects of the CSIR are, through **directed** and **particularly multidisciplinary research** and **technological innovation**, to foster, in the **national interest** and in fields which in its opinion should receive preference, **industrial and scientific development**, either by itself or in **co-operation with principals** from the **private** or **public sectors**, and thereby to contribute to the **improvement of the quality of life** of the people of the Republic, and to perform any other functions that may be assigned to the CSIR by or under this Act.”

(Scientific Research Council Act, 1988 (Act 46 of 1988, amended by Act 27 of 2014)

CSIR vision and mission

VISION

We are **accelerators** of **socioeconomic prosperity** in South Africa through **leading innovation**.



MISSION

Collaboratively innovate and localise technologies, while providing knowledge solutions for the inclusive and sustainable advancement of industry and society.

CSIR values



EXCELLENCE

We strive for excellence and quality in everything that we do. We always strive to deliver solutions that surpass the expectations of our stakeholders. We hold each other to the highest possible standard in research, development and innovation (RDI), as well as all other facets of CSIR business. We believe that excellence is a product of investing in the continuous development of our people, processes and ways of doing business.



PEOPLE-CENTRED

Our business is about touching the lives of people — our employees and business partners. We care about people. We respect each other's diversity and conduct ourselves in a manner that upholds the dignity of every person. We believe in continuous personal development and encourage one another to seize opportunities for personal growth. We treat our stakeholders the way we like to be treated.



INTEGRITY

We act with integrity. We are honest and fair when dealing with one another and our business partners. We respect the trust that our colleagues and stakeholders place in us, and commit to ethical decision-making, delivery and governance.



COLLABORATION

We are keen to learn from one another and collaborate across the organisation and with external partners to ensure that our work has the best chance of innovating a better future for South Africans. We actively share our knowledge and expertise by design, formally and informally, so that we can realise large-scale impact.

CSIR strategic objectives



SO1

Conduct research and development (R&D) of transformative technologies and accelerate their diffusion



SO2

Improve the competitiveness of high-impact industries to support South Africa's re-industrialisation by collaboratively developing, localising and implementing technology



SO3

Drive socioeconomic transformation through RD&I that supports the development of a capable state



SO4

Build and transform human capital (HC) and infrastructure



SO5

Diversify income and maintain financial sustainability and good governance

CSIR strategic intent



GROWTH

Refers to inclusive and dual growth for the country and the CSIR. The CSIR will use its capabilities in, e.g., skilled HC and infrastructure to assist in growing the economy; but will also grow to become a world-class organisation.



SUSTAINABILITY

Focuses on CSIR-developed technologies that lead to the advancement and sustainability of South African enterprises and the financial sustainability of the organisation in a resource-constrained environment.



IMPACT

Focuses on the commercialisation of our technologies and innovations for industrial development, as well as technology and knowledge transfer that enable a capable state.



RELEVANCE

Addresses the CSIR's role in driving the relevance of innovation in inclusive sustainable industrial development and the creation of a capable state.

Progress made in the implementation of the strategy: 2019/20 – 2022/23

- PG ↓ 2%
- Publications ↓ 9%
- Policies ↓ 42%
- Patents Granted ↓ 10%
- Public Sector Income ↓ 2%

- Total Income ↑ 4%
- Priority Patents ↑ 100%
- Technology Demonstrators ↑ 68%
- Licences ↑ 100%
- Technologies Localised ↑ 129%
- Joint Tech Agreements ↑ 61%
- Standards ↑ 40%
- Capable State ↑ 94%
- International Income ↑ 4%
- Private Sector Income ↑ 4%
- Ring-fenced grants ↑ 48 %

PERFORMANCE AGAINST SET TARGETS



Touching lives through innovatio

Conduct RD&I of transformative technologies and accelerate their diffusion

80%

KPI	2021/22 Actual	2022/23 Target	2022/23 Actual	Deviation from Planned Target to Actual Achievement for 2022/23
KPI 1: Publication equivalents	422.5	304.5	398	+31%
KPI 2: New priority patent applications filed	7	7	8	+14%
KPI 3: New patents granted	16	6	19 [#]	+217%
KPI 4: New technology demonstrators	55	54	62	+15%
KPI 5: Number of technology licence agreements signed	12	18	10 [*]	-44%

[#]Granting of patents is outside the influence of the organisation as it depends on the long prosecution periods in the examining jurisdictions.

^{*}Target not met due to delays in execution of licence agreements and loss of key resources, causing capacity restraints

Conduct RD&I of transformative technologies and accelerate their diffusion

Biodegradable mulch films tested for greener agriculture



- The CSIR has fully biodegradable mulch films for use in horticulture that are in field testing in sub-Saharan African countries so far.
- Three types of mulch were developed; mulch films for short-term crops that fully degrade after three months, for medium-term crop that grow for up to nine months and for long-term crops that last more than a year.

Accelerated pavement testing of new road materials and technologies



- CSIR tested a new geogrid design for an international client, strengthening and stabilizing road construction materials.
- CSIR Innovation: HVS testing reveals up to 50% cost savings and 90% longer pavement life by using organo-silanes technology in road construction.
- Organo-silanes, bridge silicon and carbon chemistry gaps to improve material properties, meet design strength criteria, and provide benefits for waterproofing.

Collaboratively improve the competitiveness of high-impact industries to support South Africa's re-industrialisation

100%

KPI	2021/22 Actual	2022/23 Target	2022/23 Actual	Deviation from Planned Target to Actual Achievement for 2022/23
KPI 6: Number of localised technologies	14	11	16	+45%
KPI 7: Number of joint technology development agreements being implemented for industry	25	27	37	+37%
KPI 8: Number of SMMEs supported	99	72	116	+61%

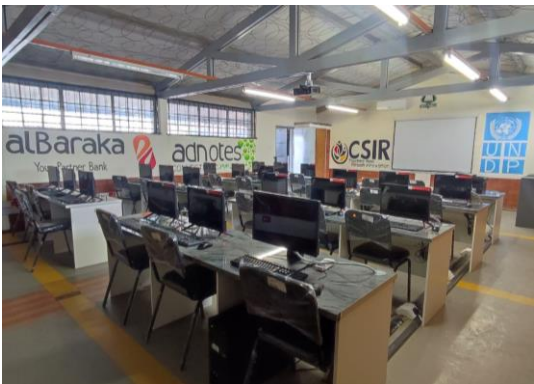
Collaboratively improve the competitiveness of high-impact industries to support South Africa's re-industrialisation

CSIR and Eskom collaborate to improve durability of components used in power generation



- The 600MW steam turbine rotor at the Tutuka power station was decommissioned due to a crack on the under-strap of the blades - a contributing factor to a recent spike in loadshedding levels.
- CSIR used laser technology developed over decades to 3D print several tenons on the lower pressure turbine blades during a refurbishment project.
- The financial benefit of refurbishment versus replacement is significant.

Implementing television white spaces to provide connectivity to rural areas



- CSIR's TV white spaces technology brings affordable broadband internet to rural and township communities by bridging the digital divide.
- CSIR empowered 13 youth and women-owned SMMEs network operators to deploy broadband infrastructure.
- Deep rural communities across multiple provinces now have access to affordable broadband connectivity, empowering economic growth and digital inclusion

Drive socioeconomic transformation through RD&I that supports the development of a capable state

100%



KPI	2021/22 Actual	2022/23 Target	2022/23 Actual	Deviation from Planned Target to Actual Achievement for 2022/23
KPI 9: Number of reports contributing to national policy development	22	13	14	+8%
KPI 10: Number of standards delivered or contributed in support of the state	8	9	14	+56%
KPI 11: Number of projects implemented to increase the capability of the state	86	45	130	+189%

Drive socioeconomic transformation through RDI that supports the development of a capable state

An app to report and monitor road maintenance issues



- Road infrastructure issues like potholes and signal failures, continued to burden on Gauteng motorists.
- CSIR developed a digital solution(app) to streamline the reporting and maintenance of road infrastructure issues in Gauteng.
- Motorists benefit from improved road safety and reduced vehicle damage due to efficient reporting and resolution of signal failures. Potholes etc.



- The CSIR has developed a new camouflage uniform and improved combat boots for the SA Army.
- The new uniform features a gendered garment design as well as a new fabric that suits diverse operational environments.
- The new boots feature a new sole technology for relative comfort in wet and dry conditions.

Build and transform HC and infrastructure

92%

KPI	2021/22 Actual	2022/23 Target	2022/23 Actual	Deviation from Planned Target to Actual Achievement for 2022/23
KPI 12: Total SET staff	1 497	1 598	1 555	-3%
KPI 13: Percentage of black SET staff	67.8%	67%	70%	+3%
KPI 14: Percentage of female SET staff	39.1%	38%	39%	+1%
KPI 15: Percentage of SET staff with a PhD	20.5%	21%	20%	-1%
KPI 16: Total chief researchers	15	16	15	-6%
KPI 17: Percentage of black chief researchers	13.3%	19%	27%	+8%
KPI 18: Percentage of female chief researchers	13.3%	13%	20%	+7%

Build and transform HC and infrastructure

92%

KPI	2021/22 Actual	2022/23 Target	2022/23 Actual	Deviation from Planned Target to Actual Achievement for 2022/23
KPI 19: Total principal researchers	188	189	195	+3%
KPI 20: Percentage of black principal researchers	34%	34%	38%	+4%
KPI 21: Percentage of female principal researchers	19%	20%	21%	+1%
KPI 22: Number of exchange programmes with industry	31	26	42	+62%
KPI 23: PPE Investment (Rm)	104	260	161*	-38%

*Target not met due to delays in the acquisition of equipment, as well as installation delays

Build and transform human capital

Strategic initiative	Focus and impact
Bursary programmes	<ul style="list-style-type: none">• Targeting undergraduate and postgraduate students to increase the pool of highly qualified individuals in STEM fields.• CSIR partnership with the DSI, NRF and SETAs.• 399 students sponsored, with 154 at PhD and 121 Masters level.
Graduates-in-Training programme	<ul style="list-style-type: none">• Holistic development of recent graduates to attain professional registration in their areas of expertise.• The programme had 30 new candidates appointed in March 2022.• A total number of 107 graduates have been supported since the inception of the programme in 2019/20, of which, 38 graduates have been appointed permanently in various clusters within the organisation.
Workplace-based learning programmes	<ul style="list-style-type: none">• Developed a Master Learning Factory to facilitate the development of skills of the future through workplace skills programme as well as influence the TVET Colleges curriculum in 4IR.• There are currently 97 interns supported within the CSIR and a total of 304 interns have been supported since the inception of the programme in 2018/19.• CSIR, DSI, DHET, NSA, NSF and SETAs partnership in advancing Skills of the Future through the Learning Factory.

Build and transform human capital

Strategic initiative

YES initiative

**Accelerated
Researcher
Development
Programme**

Focus and impact

- Develop and impart skills, as well as create job opportunities for **unemployed youth**.
 - The CSIR was the **first SOE** to implement this programme.
 - The CSIR has **74 youths on board**. The youths were placed at both the CSIR and its partnering **SMMEs** that are aligned with the organisation's RD&I.
 - Since the inception of the programme in 2020, **219 unemployed youth** have been supported by the CSIR.
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- The CSIR regards its cohort of **principal and chief researchers** as an important indicator of the organisation's capacity to fulfil its mandate and retain its status as a distinguished research organisation on the continent.
 - In 2022/23, the organisation welcomed the advancement of **three new chief researchers** (2 x black SA) and **15 principal researchers** (3 x black SA, 5 x female SA).
 - **10 black South Africans** are being supported for chief researcher and **11 black South Africans** for principal researchers under this programme.

Build and transform human capital

Strategic initiative

Focus and impact

CSI initiatives

- Supported **1767 Grade 12** learners for Mandela Day.
- Supported **7 High Schools** (four schools in rural areas) with painting of classrooms; donation of laboratory equipment, office furniture and mathematical instruments.
- Supported Gauteng Department of Basic Education with the schools of specialisation in science and innovation.

Leadership and Management Development Programme

- The Leadership Management Development Programme, in partnership with Maccauvlei and Wits Business School, was rolled out in 2022/23 with the aim to guide the development of leadership and management capabilities across different tiers of leadership from junior to top management level.
- **82** employees participated in the programme, **76** (93%) black South Africans and **39** (48%) female staff.
- **42** employees graduated with Wits Business School and **27** employees completed their programme with Maccauvlei.

Diversify income, maintain financial sustainability and good governance

88%

KPI	2021/22 Actual	2022/23 Target	2022/23 Actual	Deviation from Planned Target to Actual Achievement for 2022/23
KPI 24: Total income (Rm)	2 654	2 903	2 861	-1%
KPI 25: Net profit (Rm)	137	-5.4	43.6	+49
KPI 26: South African public sector income (% total income)	56%	55%	56%	+1%
KPI 27: South African private sector income (% total Income)	9%	12%	9%	-3%
KPI 28: International contract income (% total income)	8%	8%	9%	+1%
KPI 29: B-BBEE Rating*	1	1	1	None
KPI 30: Recordable incident rate*	0.14	≤1	0	Increased
KPI 31: Audit opinion	Unqualified audit opinion	Unqualified audit opinion	Unqualified audit opinion	Unqualified audit opinion

Diversify income, maintain financial sustainability and good governance

Focus and impact

Financial performance

- Maintained financial sustainability
- Total operating income is R203.74 million (8%) higher than the prior year and total comprehensive income increased by 15% to R60.92 million.
- Income diversification remains a key objective for the CSIR. Local public income (%) is starting to decrease while local private and international income have almost doubled in the last four years.
- The CSIR's current ratio remains healthy but decreased slightly from 1.34 (March 2022) to 1.32 at the end of the 2022/23 financial year. This is mainly due to the increase of R96.55 million in advances received from customers.
- Increased yields on cash investments and structured financial instruments after further diversification of investment portfolio

Challenges

- CSIR still has challenges in contracting with government entities to fulfil its mandated role of national R&D capabilities in enabling a capable state, due to requirement that single source procurement processes now require a thorough analysis of the market and a transparent and equitable pre-selection process be used to decide on one supplier among a few prospective bidders to make a proposal
- The CSIR skills and capability requirements are in short supply in the market and industry and impacts the business priorities
- Adverse economic climate and tight fiscal environment
- Cuts in PG in real terms
- Increased cost of doing business impacting on financial sustainability

Performance against objectives

Strategic objective	Description	2022/23 Achieved (%)	2021/22 Comparison (%)
SO1	Conduct RD&I of transformative technologies and accelerate their diffusion	80	60
SO2	Improve the competitiveness of high-impact industries to support South Africa's re-industrialisation by collaboratively developing, localising and implementing technology	100	100
SO3	Drive the socioeconomic transformation through RD&I which supports the development of a capable state	100	100
SO4	Build and transform HC and infrastructure	92	75
SO5	Diversify income, maintain financial sustainability and good governance	88	88
Overall		90	85

Summary of the 2022/23 financial year

The organisation's **2022/23** overall **performance improved** compared to the previous financial year.

The CSIR has **exceeded** several of its **KPI** targets and achieved **28 out of 31 KPI** targets for 2022/23.

The performance demonstrates the CSIR's commitment to **supporting re-industrialisation** in the country through technological support, as well as the deployment of capabilities in support of service delivery.

The organisation maintained its track record of **good governance** with once again an **unqualified audit outcome**.

The CSIR has achieved a **Level 1 B-BBEE** rating.

Transformation and **increasing our SET base** remains a priority and we have seen encouraging progress in this area.

We continue to support **youth employment** through internships as well as the **Youth Employment Service and Graduate-in-Training** programmes.

Our research programmes continue to be guided by various government strategies and frameworks, as well as the **South African Economic Reconstruction and Recovery Plan**. This will remain high on the CSIR's agenda.

THANK YOU



Touching lives through innovatio