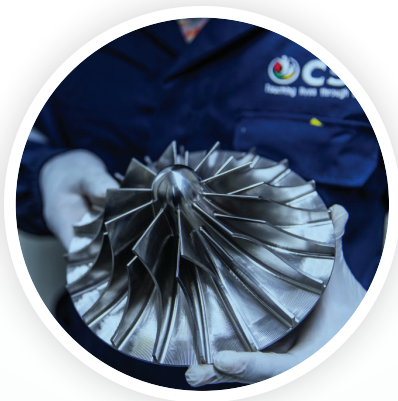
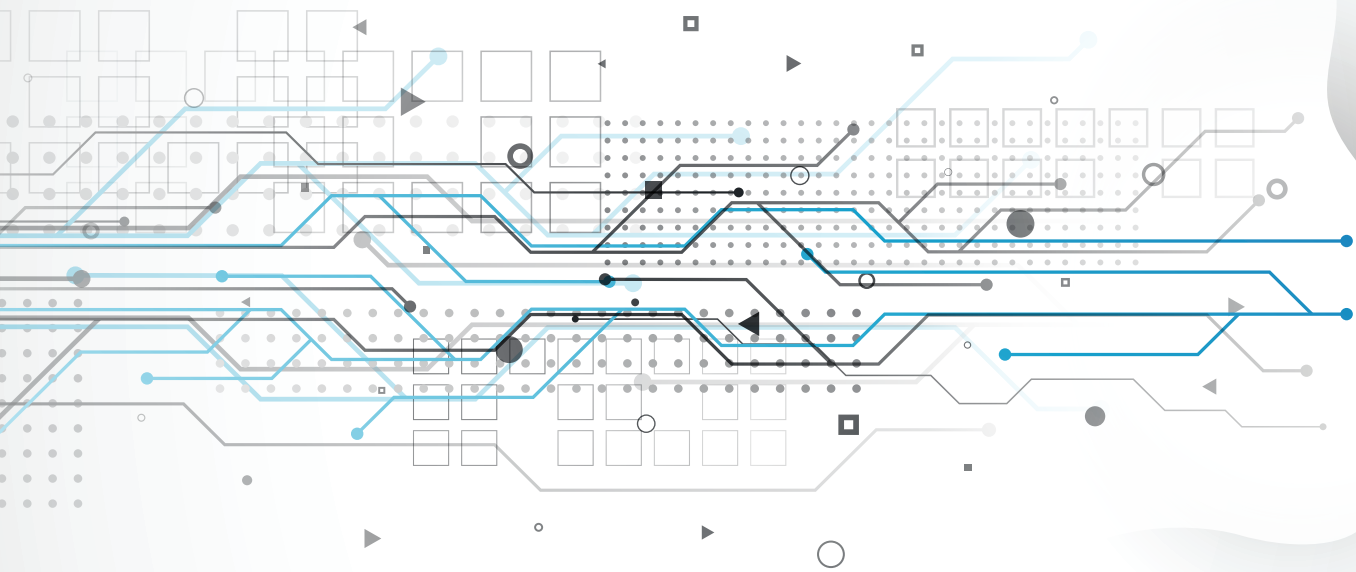


CSIR SHAREHOLDER'S COMPACT 2026 • 2027



science, technology
& innovation

Department:
Science, Technology and Innovation
REPUBLIC OF SOUTH AFRICA



CSIR
Touching lives through innovation



CSIR SHAREHOLDER'S COMPACT

FOR 2026/27

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ACRONYMS

3D	Three dimensional
4IR	Fourth industrial revolution
AfDB	African Development Bank
AI	Artificial intelligence
AMTL	Advanced Material Testing Laboratories
API	Active pharmaceutical ingredient
ARC	Audit and Risk Committee
B-BBEE	Broad-Based Black Economic Empowerment
BD&C	Business Development and Commercialisation
BEI	Business Excellence and Integration
BIDC	Biomufacturing Industry Development Centre
BIDF	Biorefinery Industry Development Facility
BIFN	BRICS Institute for Future Networks
CSIR Board	Board of Directors
BRICS	Brazil, Russia, India, China and South Africa
CeNAM	Centre for Nanostructures and Advanced Materials
CEO	Chief Executive Officer
CF	Commercialisation fund
CFO	Chief Financial Officer
cGMP	Current Good Manufacturing Practice
CO2	Carbon dioxide
CoGTA	Cooperative Governance and Traditional Affairs
Covid-19	Coronavirus disease 2019
CPAM	Collaborative Programme in Additive Manufacturing
CSD	Central Supplier Database
CSIR	Council for Scientific and Industrial Research
C-UAS	Counter-Unmanned Aircraft Systems
DBSA	Development Bank of Southern Africa
DFFE	Department of Fisheries, Forestry and the Environment
DHM	Dynamic hydraulic model
DoD	Department of Defence
DMRE	Department of Mineral Resources and Energy
DSAC	Department of Sport, Arts and Culture
DSTI	Department of Science, Technology and Innovation

the dtic	Department of Trade, Industry and Competition
ECM	Executive Cluster Manager
EE	Employment equity
EEP	Employment equity plan
ERAs	Emerging research areas
ERM	Enterprise risk management
ERMS	Enterprise Risk Management Services
ERRP	Economic Reconstruction and Recovery Plan
EPIC	Excellence, people, integrity and collaboration
ESG	Environmental, social and governance
EU	European Union
Exco	Executive Committee
FPP	Fraud prevention plan
FPMP	Fraud Prevention and Management Policy
GCIS	Government Communication Information System
GDP	Gross domestic product
GRC	Governance, risk management and compliance
HC	Human Capital
HEIs	Higher education institutions
HIP	Hot Isostatic Press
HR	Human Resources
HRSEC	Human Resource and Ethics Committee
IBH	Industrial Biocatalysis Hub
ICASA	Independent Communications Authority of South Africa
ICT	Information and Communication Technology
IKS	Indigenous knowledge systems
IMF	International Monetary Fund
IoT	Internet of things
IP	Intellectual property
IPOSS	Integrated Port Operations Support System
ISO	International Organisation for Standardisation
IT	Information technology
KPIs	Key performance indicators
KSS	Knowledge sharing systems
LCBE	Legal, Compliance and Business Enablement

LF	Learning Factory
LoC	Lab-on-Chip
MDDV	Medical devices, diagnostics and vaccines
MESA	Manufacturing Enterprise Solutions Association
MerSETA	Manufacturing, Engineering and Related Services Sector Education and Training Authority
MMR	Mining and Minerals Resources
MICT	Media, Information and Communication Technologies
MTEF	Medium-term Expenditure Framework
MSc	Master of Science
NACI	National Advisory Council on Innovation
NDOH	National Department of Health
NEPAD	New Partnership for Africa's Development
NHLS	National Health Laboratory Service
NICIS	National Integrated Cyberinfrastructure System
NIDF	Nanomaterials Industrial Development Facility
NMISA	National Metrology Institute of South Africa
NRF	National Research Foundation
NSI	National System of Innovation
NT	National Treasury
NWU	North-West University
OEM	Original equipment manufacturer
Opco	Operations Committee
PhD	Doctor of Philosophy
PFMA	Public Finance Management Act, 1999 (Act 1 of 1999) as amended by Act 29 of 1999
PG	Parliamentary Grant
PoC	Point-of-care
PoPIA	Protection of Personal Information Act
PPE	Property, plant and equipment
PV	Photovoltaics
R&D	Research and development
RD&I	Research, development and innovation
RIR	Recordable incident rate
Rm	Rand in millions
RMP	Risk Management Plan
SaaS	Software as a service

SADC	Southern African Development Community
SADiLaR	South African Centre for Digital Language Resources
SAHPRA	South Africa Health Products Regulatory Authority
SALGA	South African Local Government Association
SANAS	South African National Accreditation System
SANBio	Southern Africa Network for Biosciences
SANDF	South African National Defence Force
SANEDI	South African National Energy Development Institute
SAPS	South African Police Service
SET	Science, engineering and technology
SETAs	Sector Education and Training Authorities
SGCs	Societal grand challenges
SHEQ	Safety, health, environment and quality
SMMEs	Small, medium and micro enterprises
SOEs	State-owned enterprises
SOs	Strategic objectives
STEM	Science, Technology, Engineering, and Mathematics
STI	Science, technology and innovation
STISA	Science, Technology and Innovation Strategy for Africa
TIA	Technology Innovation Agency
TIC	Technology Innovation Centre
TMM	Trackless mobile machinery
TOdB	Technical Outputs Database
TRL	Technology readiness level
TVET	Technical and Vocational Education and Training
UAVs	Unmanned aerial vehicles
UCT	University of Cape Town
UNDP	United Nations Development Programme
UNIDO	United Nations Industrial Development Organisation
USA	United States of America
VRE	Variable renewable energy
Wits	University of the Witwatersrand

II THE SHAREHOLDER'S COMPACT

The Shareholder's Compact is a performance agreement between the Council for Scientific and Industrial Research (CSIR) and the Minister of Science, Technology and Innovation. It consists of the text of the compact itself and a series of supporting annexures that cover the following aspects:

Strategic planning documents:

- Strategic Plan: 2026/27 – 2030/31 (Annexure A); and
- Annual Performance Plan: 2026/27 (Annexure B).

Documents setting out the governance structures and risk management strategies of the CSIR:

- Governance Structure (Annexure C);
- Risk Management Plan (Annexure D);
- CSIR Top Risks (Annexure H)
- Fraud Prevention Plan (Annexure E); and
- Materiality/Significance Framework (Annexure F).

Documents setting out the CSIR Financial Plan and CSIR's compliance with applicable financial legislation:

- Financial Plan (Annexure G).

SHAREHOLDER'S COMPACT AGREEMENT

FOR THE CYCLE COMMENCING 1 APRIL 2026 MADE AND ENTERED INTO BY AND BETWEEN:
THE MINISTER OF SCIENCE, TECHNOLOGY AND INNOVATION

Dr Blade Nzimande, in his capacity as Executive Authority, being the responsible Cabinet member
(hereinafter referred to as 'the Executive Authority')

and

THE CSIR BOARD

Vuyani Jarana in his capacity as Accounting Authority and Chairperson of the CSIR Board (hereinafter referred to
as 'the Accounting Authority')

(The Parties are hereinafter collectively referred to as 'the Parties')

WHEREAS:

The Parties wish to conclude a Shareholder's Compact to underscore a constructive working relationship between them, clarify mutual expectations that are to be satisfied, articulate the CSIR's role in support of the effective functioning of the National System of Innovation (NSI) and establish a framework of good corporate governance;

Treasury Regulation 29.2, issued under the Public Finance Management Act (PFMA), further requires the Accounting Authority of a Schedule 3B public entity to conclude a Shareholder's Compact with its Executive Authority annually; and

The CSIR Board is the organisation's Accounting Authority and the Minister of Science, Technology and Innovation its Executive Authority as the Cabinet member responsible for the CSIR; the Parties have negotiated and reached an agreement on the contents of the Shareholder's Compact and wish to record the same in writing.

NOW, THEREFORE, THE PARTIES HEREBY AGREE AS FOLLOWS:

GLOSSARY OF TERMS

In this Shareholder's Compact, the following words and/or phrases shall have the following meanings:

- **Accounting Authority** means the CSIR Board as established in terms of section 7 of the Scientific Research Council Act.
- **The Corporate Plan**, as embodied in Annexures A to H to this Shareholder's Compact, with:
 - Annexure A being the CSIR Strategic Plan;
 - Annexure B being the CSIR Annual Plan for the 2026/27 financial year;
 - Annexure C being the CSIR Governance Structure
 - Annexure D being the CSIR Risk Management Strategy (Plan) and CSIR Top Risks (Annexure H);
 - Annexure E being the CSIR Fraud Prevention Plan (FPP);
 - Annexure F being the Materiality Framework; and
 - Annexure G being the Financial Plan (including the Budget and Cash flow for 2026/27; the Group's three-year Financial Plan and the three-year Borrowing Plan).
- **Annual budget** means the CSIR's annual budget as embodied in Annexures A, B and G.
- **Balanced Scorecard Framework** means the Executive Authority's framework for evaluating the performance of science, engineering and technology (SET) institutes described in the DSTI publication entitled "Reviewing the science, engineering, technology and innovation scorecards," dated May 2003.
- **Basic Conditions of Employment Act** means Act 75 of 1997.

- **B-BBEE Codes** means the Broad-Based Black Economic Empowerment Codes as published in the Government Gazette from time to time.
- **EE Act** means Act 55 of 1988.
- **Effective date** means the effective date of this Shareholder’s Compact, which shall be 1 April 2026.
- **Executive Authority** means the Minister of Science, Technology and Innovation.
- **KPIs** means the performance measures described in the Corporate Plan, against which the performance of the CSIR shall be evaluated.
- **Labour Relations Act** means Act 66 of 1995.
- **Materiality Framework** means the materiality framework as recorded in Annexure F.
- **Parties** means the Executive Authority and the Accounting Authority, respectively.
- **PFMA** means Act 1 of 1999.
- **PoPIA** means Act 4 of 2013.
- **Shareholder’s Compact** means this document and all annexures thereto.
- **Scientific Research Council Act** means the CSIR’s enabling legislation, namely Act 46 of 1988.
- **Skills Development Act** means Act 97 of 1998.
- **Treasury Regulations** means any prescripts or legislative requirements or practice notes issued by NT for implementation by government departments, trading entities, constitutional institutions and public entities issued in line with the PFMA.

THE SHAREHOLDER’S COMPACT

This Shareholder’s Compact represents the agreement between the Executive Authority of the CSIR, being the Minister of Science, Technology and Innovation, and the Accounting Authority of the CSIR, being the CSIR Board, herein represented by the Chairperson of the Board. It reflects the expectations of each of the Parties, expressed in terms of outcomes and outputs that need to be achieved during the financial year starting on 1 April 2026.

This Shareholder’s Compact shall operate from the effective date and will be reviewed by the Parties at the end of the financial year ending on 31 March 2027.

LEGAL REQUIREMENT AND PRIMARY RELATIONSHIP BETWEEN THE SIGNATORIES

Chapter 29 of the Treasury Regulations imposes the following legal requirements on the Accounting Authority of a Schedule 3B public entity, such as the CSIR and its Executive Authority, in terms of the conclusion of a Shareholder’s Compact:

- | | |
|---------|--|
| “29.2 | <i>Shareholder’s Compact</i> |
| 29.2.1. | <i>The Accounting Authority for a public entity listed in Schedule 2, 3B or 3D must, in consultation with its Executive Authority, annually conclude a Shareholder’s Compact.</i> |
| 29.2.2. | <i>The Shareholder’s Compact must document the mandated key performance measures and indicators to be attained by the public entity as agreed between the Accounting Authority and the Executive Authority.”</i> |

FRAMEWORK OF THE SHAREHOLDER’S COMPACT

In terms of section 3 of its enabling legislation, namely the Scientific Research Council Act, the mandate of the CSIR is as follows:

“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.”

The Shareholder's Compact

The CSIR's strategic objectives (SOs) are outlined in the Corporate Plan, which incorporates the CSIR Strategic Plan and the CSIR Annual Plan for the 2026/27 planning cycle; the CSIR's Risk Management Strategy; the CSIR's FPP; the Materiality Framework; the Budget and Cash Flow for 2026/27; the Group's three-year financial plan and the organisation's three-year borrowing plan. The Accounting Authority undertakes to oversee the implementation of the said elements of the Corporate Plan.

INTERNAL TRANSFORMATION

In Annexure A, the Corporate Plan of the CSIR deals with matters relating to transformation, among others. In giving effect to the Corporate Plan, the Accounting Authority will ensure that the CSIR is in full compliance with all applicable legislation, such as, but not limited to, the EE Act, the Skills Development Act, the Labour Relations Act, the Basic Conditions of Employment Act and the B-BBEE Codes.

THE ROLE AND POWERS OF THE ACCOUNTING AUTHORITY

The role and powers of the Accounting Authority are set out in sections 7(1), 11, 12 and 19 of the Scientific Research Council Act, read with section 3 of the Science and Technology Laws Amendment Act, 2014 (Act 7 of 2014).

In terms of section 56 of the PFMA, the Accounting Authority has delegated, in writing, certain of the powers entrusted or delegated to it to officials in the CSIR. To this end, the Accounting Authority has also adopted an approval framework, which governs the authorisation process in the CSIR. It deals with the development of strategic and operational plans and budgets, appointment of staff, approval of salaries and acquisition and disposal of assets, among others. It also defines authority levels in relation to organisational positions.

The Materiality Framework for reporting losses through criminal conduct and irregular, fruitless and wasteful expenditure, as well as for significant transactions as envisaged by sections 55 (2) and 54 (2) of the PFMA, is in place and is included as Annexure F attached hereto.

UNDERTAKINGS BY THE ACCOUNTING AUTHORITY OF THE PUBLIC ENTITY

- The Accounting Authority undertakes to act in accordance with the approved Corporate Plan attached hereto.
- In the event that the Accounting Authority will not be able to fully execute the plans as embodied in Annexure A, it will promptly and in writing, inform the Executive Authority accordingly to seek its advice prior to making decisions or taking action.
- The Accounting Authority confirms that it will comply with the provisions of sections 50 and 51 of the PFMA, as more fully dealt with in Annexures D, E and F attached hereto, as well as with the reporting requirements as embodied in the PFMA and the relevant Treasury Regulations.
- The Accounting Authority undertakes to ensure that the CSIR complies with its statutory mandate as encapsulated in section 3 of the Scientific Research Council Act.

UNDERTAKINGS BY THE EXECUTIVE AUTHORITY AS THE SHAREHOLDER

The Executive Authority undertakes to allow the Accounting Authority to manage the business of the CSIR as has been approved in the Corporate Plan through ensuring the following:

- Issuing of instructions and requests for information with sufficient prior notice and response times, with due cognisance that this will not be applicable in instances where Parliament requires the information and must be provided urgently;
- Not renegeing on written guarantees and undertakings given;
- Providing the organisation with strategic direction and control; and
- Complying with the relevant provisions of the PFMA, as well as the Treasury Regulations insofar as the same relates to it in terms of the relationship between the Parties.

GOVERNANCE

The Accounting Authority recognises that systems of good corporate governance should be in place and reviewed continuously to ensure that they are sound and consistent with world-class standards and that they are and remain relevant to the business of the CSIR. Apart from complying with the provisions of the Scientific Research Council Act, the Science and Technology Laws Amendment Act, the PFMA, as well as the Treasury Regulations issued thereunder, and all other applicable legislation, the Accounting Authority shall also ensure compliance with the relevant provisions of the King V Code on Corporate Governance (2026), and the Protocol on Corporate Governance in the Public Sector (2002) issued by the then Department of Public Enterprises.

The Accounting Authority will strive to ensure that the CSIR upholds and sets in place review mechanisms and protocols to ensure that reports and publications, including public comments made by the employees of the CSIR, are based on sound scientific analysis, and do not bring the institution into disrepute.

KPIs LINKED TO THE BALANCED SCORECARD FRAMEWORK

The KPIs have been summarised according to the categories of the Balanced Scorecard Framework of the DSTI and reflect the SOs of the CSIR. The CSIR's SOs are explained in greater detail below.

The CSIR's KPIs provide an understanding of performance in terms of inputs, outputs, efficiencies and, to some extent, provide lead indicators of the outcomes and impact that are required for the CSIR to fulfil its mandate. The KPIs are aligned to the SOs and provide a basket of measures that reflect various aspects of organisational performance. The categories and their associated SOs are:

SO1: CONDUCT RESEARCH, DEVELOPMENT AND INNOVATION OF TRANSFORMATIVE TECHNOLOGIES AND ACCELERATE THEIR DIFFUSION

This SO seeks to ensure that the CSIR undertakes cutting-edge RD&I in areas that will bring transformative change in the South African economy and society.

KPI 1: Publication equivalents

Research publications are a measure of the CSIR's research capabilities and outputs. The quantity and quality of peer-reviewed research publications is a measure of the quality and depth of the scientific knowledge base. Publication equivalents consist of peer-reviewed journal articles, peer-reviewed conference papers, peer-reviewed book chapters and books.

KPI 2: New priority patent applications filed

At the CSIR, priority patent filings serve as a pipeline indicator of patent families. A priority patent is the first patent application filed for the protection of a particular invention with the CSIR named as an applicant/assignee/co-applicant/co-assignee.

KPI 3: New patents granted

Patents provide a lead indicator of the potential impact to be achieved when technologies are commercialised. Patents are exclusive rights granted for inventions and are conferred by an examining patent authority with the CSIR named as an applicant/assignee/co-applicant/co-assignee.

KPI 4: New technology demonstrators

This is a measure of an intermediate output of RD&I activities with the potential to be developed further and that can be transferred to various markets for socioeconomic impacts. A prototype – a rough example of a conceivable technology (product or system) derived from existing knowledge gained from research and/or practical experience as proof of concept.

KPI 5: Number of technology licence agreements signed

This indicator is a measure of the uptake of CSIR intellectual property (IP) in the market. A licence is an agreement in terms of which the CSIR grants rights to another party to exploit IP developed by the CSIR, typically in exchange for royalty payments and/or other licence fees.

SO2: IMPROVE THE COMPETITIVENESS OF HIGH-IMPACT INDUSTRIES TO SUPPORT SOUTH AFRICA'S RE-INDUSTRIALISATION BY COLLABORATIVELY DEVELOPING, LOCALISING AND IMPLEMENTING TECHNOLOGY

This SO seeks to improve the competitiveness of South Africa's high-impact industries through research, technology development and localisation in a collaborative manner, thereby contributing to the re-industrialisation of the country.

KPI 6: Number of localised technologies

The indicator aims to diffuse technologies commercialised or industrialised from elsewhere in the world that have demonstrated potential to positively affect the competitiveness of industry upon competent adoption by users or is a strong candidate to be an input into innovation or enhancements of other systems for the improvement of industrial activities or the capabilities of the state. A localised technology is a technology that has been invented or commercialised outside of South Africa and has been or will be introduced/adapted in South Africa for commercial or scientific benefit or a technology that has been locally developed as an import replacement.

KPI 7: Number of joint technology development agreements being implemented for industry

This indicator measures the CSIR's technology development collaborations with industry partners with the intention to commercialise and industrialise. A joint technology development initiative with an industry partner under a written agreement, where each party brings the needed capability for the development and/or implementation of the technology.

KPI 8: Number of SMMEs supported

The indicator measures the CSIR's contribution to socioeconomic development and industrialisation through the support of SMMEs. Support of SMMEs (as described in Schedule 1 of the National Definition of Small Enterprise in South Africa under the National Small Enterprise Act), through the implementation of RD&I and technology interventions that contribute to SMMEs becoming more productive, efficient and sustainable.

SO3: DRIVE SOCIOECONOMIC TRANSFORMATION THROUGH RD&I THAT SUPPORTS THE DEVELOPMENT OF A CAPABLE STATE

This SO emphasises the CSIR's role in supporting the development of a capable state and enabling the government to drive the socioeconomic transformation of South Africa through RD&I.

KPI 9: Number of reports directly contributing to national policy formulation and development

The indicator measures the CSIR's support to the government with evidence-based policy development and decision-making that can benefit from significant science, engineering and innovation input. Evidence-based policy development support is provided to various arms of government.

KPI 10: Number of standards delivered or contributed to in support of the State

The indicator measures the CSIR's support for government policy and regulation through the development of standardised practice guidelines across economic and social sectors. New or updated standards adopted by the state and SOEs that the CSIR has developed and delivered or to which it contributed (e.g., interoperability standards, accessibility standards, products or infrastructure standards).

KPI 11: Number of projects implemented to increase the capability of the state

This indicator measures the number of projects that the CSIR implements on behalf of the state. The CSIR-facilitated implementation of technologies (CSIR-created or otherwise) that improve the efficiency of government, SOEs and South African Universities.

SO4: BUILD AND TRANSFORM HUMAN CAPITAL AND INFRASTRUCTURE

This SO seeks to build and transform the required HC and investment in infrastructure to drive industrialisation and the advancement of society.

KPI 12: Total science, engineering and technology staff

The indicator is a measure of the CSIR's capacity to deliver on RD&I projects. The number of CSIR staff qualified in the field of SET.

KPIs 13 and 14: Percentage of South African SET staff who are black and female, respectively

These indicators measure the degree of demographic transformation within the RD&I capacity of the organisation. Percentage of staff who are black (as per B-BBEE Act definition) and percentage of SET staff who are female, respectively.

KPI 15: Percentage of SET staff with a doctoral qualification

The indicator measures the organisation's capacity to conduct and supervise quality research and to innovate. The proportion of SET staff who have doctoral-level qualifications.

KPI 16: Total chief researchers

The indicator is a measure of the quality of SET capacity and its potential influence in the local and international RD&I spaces (capacity to collaborate and share resources). The number of CSIR staff appointed and/or recognised as chief researchers through the formal Career Ladder process.

KPIs 17 and 18: Percentage of chief researchers who are black and female, respectively

These indicators measure the level of demographic transformation within the chief researcher level. The proportion of black (as per B-BBEE Act definition) South African and the proportion of female South African citizens who are chief researchers (as per CSIR's Career Ladder process).

KPI 19: Total principal researchers

The indicator is a measure of the quality of SET capacity and its potential influence in the local and international RD&I spaces (capacity to collaborate and share resources). The number of CSIR staff appointed and/or recognised as principal researchers through the formal Career Ladder process.

KPIs 20 and 21: Percentage of principal researchers who are black and female, respectively

These indicators measure the level of demographic transformation within the principal researcher level. The proportion of black (as per B-BBEE Act definition) South African and the proportion of female South African citizens who are principal researchers (as per CSIR's Career Ladder process).

KPI 22: Number of staff involved in exchange programmes with industry

The indicator measures the level at which CSIR shares expertise and resources to strengthen collaborations with the industry to achieve organisational growth. The exchange of staff between the CSIR and industry for a period of time to share/gain expertise for the advancement of business growth opportunities and capacity development.

KPI 23: Property, plant and equipment investment (Rm)

This indicator provides a measure of the CSIR's investment in research infrastructure to develop and maintain world-class facilities and equipment to provide the quality of RD&I that is expected of it. PPE investment is the amount invested in CSIR and government grant-funded PPE, as well as qualifying leases (as per Accounting Standard on Leases) for a financial year.

SO5: DIVERSIFY INCOME, MAINTAIN FINANCIAL SUSTAINABILITY AND GOOD GOVERNANCE

This SO seeks to improve the CSIR's financial sustainability by diversifying revenue sources and optimising the business model to achieve competitiveness supported by good, efficient and sound governance.

KPI 24: Total operating income (Rm)

The indicator reflects the ability of the CSIR to ensure financial sustainability. Growth in total operating income indicates growth in the outcomes and impact achieved by the CSIR. Total operating income includes revenue declared on R&D contracts (contract R&D income), income derived from licences and royalties, PG received through the Science Vote, as well as other income.

KPI 25: Net profit (Rm)

Net profit is a key indicator of financial sustainability and the ability of the organisation to manage its expenses according to the affordability determined by income levels. Profit for a financial year, which is calculated as total operating income, less total operating expenditure (including the performance bonus accrual), plus net finance income.

KPI 26: South African public sector income (% total income)

South African public sector income reflects the degree of government public income in the CSIR. South African public sector income is the total income earned from South African government departments (i.e. national, provincial and local), constitutional entities and public entities (as listed in the schedules to the PFMA). This includes revenue declared on R&D contracts (contract R&D income), directed/ring-fenced PG received through the Science Vote and any other forms of funding received from South African public entities.

KPI 27: South African private sector income (% total income)

South African private sector income reflects the degree of private sector investment in the CSIR. South African private sector income is the total income earned from South African non-public entities – not listed as public entities in the schedules of the PFMA and the Municipal Finance Management Act (MFMA). This includes not-for-profit organisations. Licences, royalties and interest income are not included in the definition of South African private-sector investment.

KPI 28: International contract income (% total Income)

International contract income reflects the global relevance of the CSIR. Growth in international investment is a key indicator of income diversification, as well as the relevance and impact of the CSIR within the global economy. International contract income is the total income earned from foreign customers (i.e. entities incorporated outside the borders of South Africa). This includes revenue declared on R&D contracts and other income received from foreign entities.

KPI 29: Broad-Based Black Economic Empowerment rating

The indicator is a measure of the CSIR's compliance with the Broad-Based Black Economic Empowerment (B-BBEE) Act in its contribution to support socioeconomic transformation in South Africa. A B-BBEE rating is a verification certificate issued by a SANAS-approved verification agency that determines the CSIR's contribution to black (as per B-BBEE Act definition) economic empowerment.

KPI 30: Recordable incident rate

The RIR indicates the effectiveness of the health and safety management system within the organisation in a year. The RIR is the number of recordable incidences (or cases) multiplied by 200 000 divided by the number of hours worked. A recordable incident is a work-related injury or illness that results in one or more of the following criteria:

- Death;
- Loss of consciousness;
- Restricted work or transfer to another job;
- Days away from work; and/or
- Medical treatment beyond first aid.

KPI 31: Audit opinion

The indicator is a measure of the CSIR's accountability and governance. The Auditor-General defines a 'clean audit' as achieving an unqualified audit opinion on the audits of annual financial statements and pre-determined objectives, as well as not having material findings on the audit of compliance with laws and regulations.

The target values for the set of KPIs are given in Table 1.

Table 1: CSIR KPIs for 2026/27

KPI	Actual 2023/24	Actual 2024/25	Target 2025/26	Target 2026/27
SO1: Conduct RD&I of transformative technologies and accelerate their diffusion				
KPI 01: Publication equivalents	390	497	300	356
KPI 02: New priority patent applications filed	5	6	6	6
KPI 03: New patents granted	16	17	9	13
KPI 04: New technology demonstrators	77	61	58	68
KPI 05: Number of technology licence agreements signed	13	12	14	14
SO2: Improve the competitiveness of high-impact industries to support South Africa's re-industrialisation by collaboratively developing, localising and implementing technology				
KPI 06: Number of localised technologies	28	31	10	21
KPI 07: Number of joint technology development agreements being implemented for industry	42	49	33	38
KPI 08: Number of SMMEs supported	179	175	115	109
SO3: Drive the socioeconomic transformation through RD&I, which supports the development of a capable state				
KPI 09: Number of reports contributing to national policy development	27	20	19	24
KPI 10: Number of standards delivered or contributed to support the state	21	28	9	11
KPI 11: Number of projects implemented to increase the capability of the state	184	224	117	134
SO4: Build and transform HC and infrastructure				
KPI 12: Total SET staff	1605	1617	1642	1642
KPI 13: Percentage of SET staff who are black	72%	73%	72%	72%
KPI 14: Percentage of SET staff who are female	39%	40%	40%	40%
KPI 15: Percentage of SET staff with PhDs	19%	19%	19%	19%
KPI 16: Total chief researchers	16	21	20	20
KPI 17: Percentage of chief researchers who are black	25%	29%	30%	30%
KPI 18: Percentage of chief researchers who are female	19%	24%	20%	20%
KPI 19: Total principal researchers	195	202	195	175
KPI 20: Percentage of principal researchers who are black	41%	41%	40%	40%
KPI 21: Percentage of principal researchers who are female	22%	23%	23%	25%
KPI 22: Number of staff involved in exchange programmes with industry	47	53	31	34
KPI 23: PPE investment (Rm)	263	505	165	170
SO5: Diversify income, maintain financial sustainability and good governance				
KPI 24: Total income (Rm)	3179	3543	3207	3299
KPI 25: Net profit (Rm)	36.47	40.62	(30.8)	(9.8)
KPI 26: South African public sector income (% total income)	59%	64%	59%	58%

KPI	Actual 2023/24	Actual 2024/25	Target 2025/26	Target 2026/27
KPI 27: South African private sector income (% total income)	8%	7%	8%	8%
KPI 28: International contract income (% total income)	10%	10%	11%	11%
KPI 29: B-BBEE rating	1	1	1	1
KPI 30: Recordable incident rate	0.09	0.12	≤0.3	≤0.2
KPI 31: Audit opinion	Unqualified audit opinion	Unqualified audit opinion	Unqualified audit opinion	Unqualified audit opinion

REPORTING

- The Accounting Authority will report on the achievement of its KPIs quarterly, based on PFMA requirements.
- A detailed KPI report, approved by the Accounting Authority, will be submitted to the Executive Authority annually on or before 31 July of each year, in respect of the immediately preceding financial year. The format of such reporting will be based on the CSIR's KPIs linked to the categories of the Balanced Scorecard Framework.
- The Accounting Authority will meet all the external audit requirements, the results of which will be made available to the Executive Authority and the external auditor of the CSIR, being the Auditor-General, who is responsible for independently auditing and reporting on the financial statements of the CSIR.

EXTRAORDINARY REPORTING

The Accounting Authority will, at its discretion, report to the Executive Authority on matters of strategic importance and/or operational issues that fall outside the agreed framework of this Shareholder's Compact and the PFMA, as agreed to from time to time during its Board meetings.

SUPPORTING DOCUMENTATION

Supporting documentation to this Shareholder's Compact is to be found in the following documents attached hereto:

- CSIR Strategic Plan for 2026/27 as embodied in Annexure A;
- CSIR Annual Plan for 2026/27 as embodied in Annexure B;
- Risk Management Strategy (Plan) as embodied in Annexure D;
- CSIR Top Risks as embodied in Annexure H;
- FPP as embodied in Annexure E;
- Materiality Framework as embodied in Annexure F; and
- Financial Plan as embodied in Annexure G.

PENALTIES AND REWARDS

The Accounting Authority, in terms of the provisions of section 12 of the Scientific Research Council Act, shall determine the remuneration payable to employees of the CSIR and, in addition, approve the payment of allowances, subsidies and benefits, including performance bonuses.

GOVERNING LAW AND DISPUTE RESOLUTION

This Shareholder's Compact shall be governed by and construed in accordance with the laws of the Republic of South Africa. In the event of any dispute arising from this Shareholder's Compact, the Parties shall make every effort to settle such dispute amicably.

Should the dispute, despite such mediation, remain unresolved for a further period of 30 days after being so referred, either Party may declare such dispute a formal intergovernmental dispute by notifying the other Party of such declaration in writing. In which event, the Parties will follow the procedure as outlined in section 42 of the Intergovernmental Relations Framework Act, 2005 (Act 13 of 2005).

Should the dispute remain unresolved for a period of 30 days, the said dispute or difference shall be adjudicated upon by a competent third party agreed upon by the Parties, unless otherwise agreed between the Parties by means of arbitration, mediation, or other agreement.

Should the Parties be unable to agree upon a competent third party, as contemplated in clause 15.2, the dispute will be adjudicated by a competent court with jurisdiction to hear the matter.

NOTICES

1. The Parties choose as their domicilium addresses for purposes of this Shareholder's Compact, the following physical addresses:
 - The Accounting Authority: in the care of the Office of the Chief Executive Officer, CSIR, Building 3, CSIR Campus, Meiring Naudé Road, Brummeria, Pretoria, 0184
 - The Executive Authority: Building 53, CSIR Campus, Meiring Naudé Road, Brummeria, Pretoria, 0184
2. Each Party shall be entitled, from time to time, by written notice to the other, to vary its domicilium to any other address within the Republic of South Africa, which is not a post office box or poste restante.
3. Any notice given by one Party to the other ('the addressee') which:
 - is delivered by hand during the normal business hours of the addressee at the addressee's domicilium for the time being shall be presumed, until the contrary is proved, to have been received by the addressee at the time of delivery;
 - is posted by pre-paid registered post from an address within the Republic of South Africa to the addressee at the addressee's domicilium for the time being shall be presumed, until the contrary is proved, to have been received by the addressee on the fourth day after the date of posting; and/or
 - is transmitted by telefax or e-mail shall be deemed (in the absence of proof to the contrary) to have been received within one hour of transmission, where it is transmitted during normal business hours of the receiving instrument, and within two hours of the commencement of the following business day where it is transmitted outside those business hours.

WHOLE AGREEMENT

This document, together with the annexures thereto, constitutes the whole of the agreement between the Parties. No instructions, agreements, representations or warranties between the Parties, other than those set out herein, are binding on the Parties. All undertakings and annexures to this Shareholder's Compact are declared active on the effective date.

VARIATIONS

No variation or modification of any provision of this Shareholder's Compact or consent to deviate therefrom or waiver in terms thereof shall be valid unless such variation or modification or waiver has been reduced to writing and signed by both Parties, and such variation, modification, consent or waiver shall be valid only for a specific case and only for the purpose and extent to which it was made or given.

AMENDMENTS TO THE SHAREHOLDER'S COMPACT

Should either Party wish to make any amendment or alteration to the Shareholder's Compact, that Party shall prepare a change order and present it to the other Party, which shall specify the following:

- The date of the change order;
- The description of the proposed amendment or alteration;
- Previous unspecified ad hoc work to be undertaken, if applicable;
- The reason for making the proposed amendment or alteration;

- When the Party requires the change to be implemented;
- The resources available; and
- The continued balance of the Parties' obligations under this Shareholder's Compact.

The other Party shall be given an opportunity to consider such change order and make a decision on whether it is prepared to accept such change or not; and

No change order shall be of any force and effect until it is signed by duly authorised representatives of each of the Parties.

UNDERTAKING BY THE CHAIRPERSON OF THE CSIR BOARD

The Chairperson of the CSIR Board undertakes to represent the Accounting Authority in carrying out the terms of this Shareholder's Compact and in cascading the spirit of the agreement through the ranks of the CSIR.

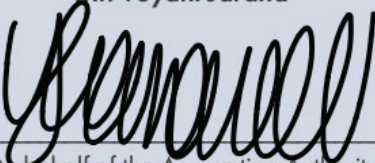
UNDERTAKING BY THE MINISTER OF SCIENCE, TECHNOLOGY AND INNOVATION

The Minister of Science, Technology and Innovation, Dr Blade Nzimande, approves of this approach and looks forward to the successful implementation of the undertakings embodied in this Shareholder's Compact and its annexures. The Minister accepts that, although the details of this Shareholder's Compact may change due to variations and changes in the market and society, the spirit thereof will remain unchanged.

THE CSIR SHAREHOLDER'S COMPACT

Agreed to and signed in **Pretoria** on **10 February** 2026

Mr. Vuyani Jarana



On behalf of the Accounting Authority

Agreed to and signed in **Pretoria** on **24 February** 2026

Dr. Blade Nzimande



The Executive Authority



STRATEGIC PLAN

2026/27 – 2030/31

A.1 OVERVIEW AND BACKGROUND

A.1.1 CSIR MANDATE

The CSIR was established on 5 October 1945 by an Act of Parliament. The Act under which the CSIR now operates, the Scientific Research Council Act, 1988 (Act 46 of 1988) as amended by the Scientific Research Council Amendment Act, 1990 (Act 71 of 1990), the General Law Amendment Act, 1996 (Act 49 of 1996), the Measurement Units and Measurement Standards Act, 2006 (Act 18 of 2006), the Science and Technology Laws Amendment Act, 2011 (Act 16 of 2011), the Science and Technology Laws Amendment Act, 2014 (Act 7 of 2014) and Science and Technology Laws Amendment Act, 2020 (Act 9 of 2020) stipulates the following mandate:

Figure A1: 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, as amended)**

Specifically, section 4(a)(i) of the Act dictates that the CSIR supports better utilisation of the resources of the Republic. This is achieved through the improvement of the productive capacity of its population, improvement of technical processes and methods to improve industrial production, the promotion and expansion of existing, as well as the establishment of new industries, standardisation in industry and commerce, and training of the national workforce.

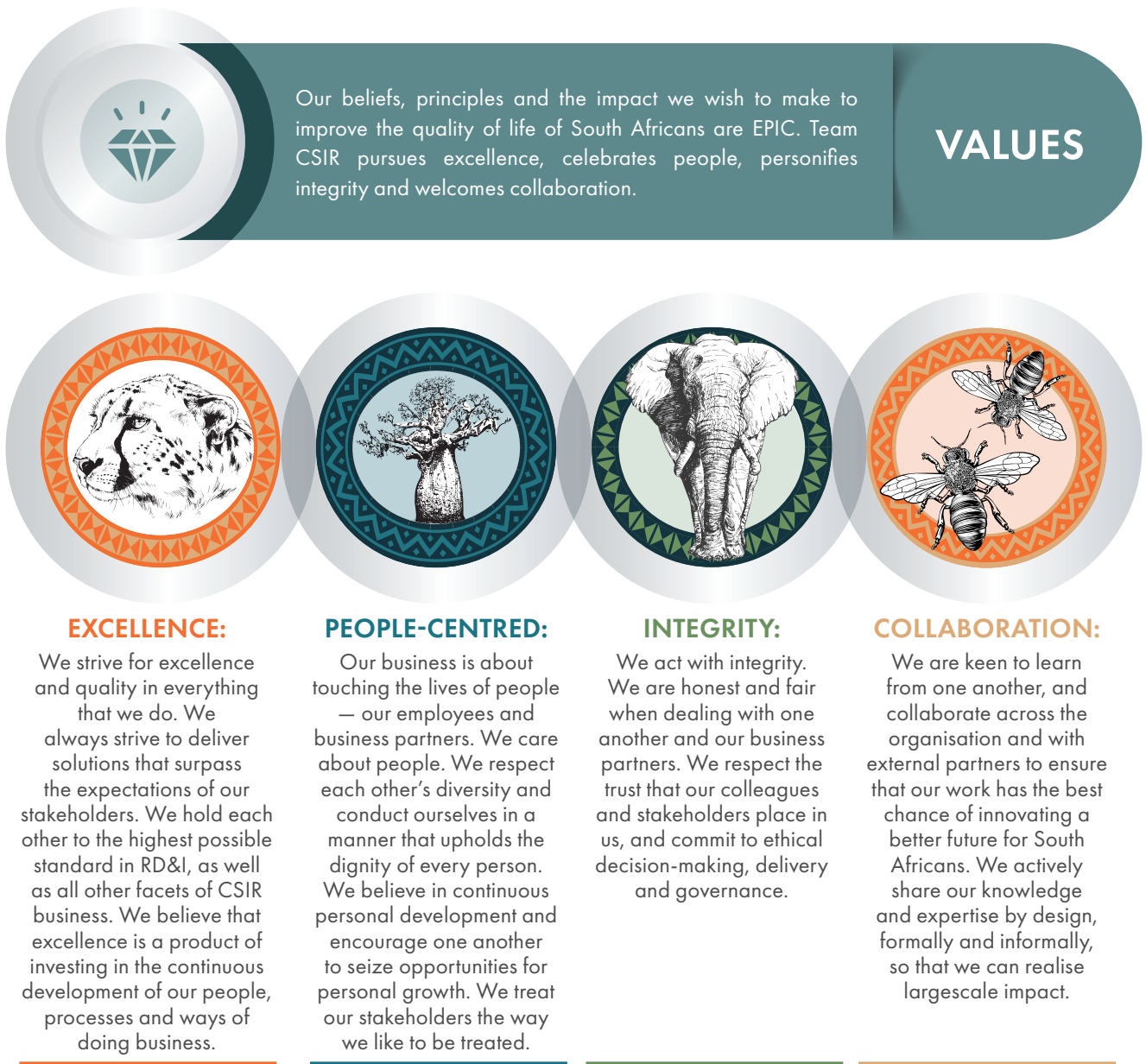
A.1.2 VISION AND MISSION

Figure A2: CSIR Vision and Mission



A.1.3 CSIR VALUES

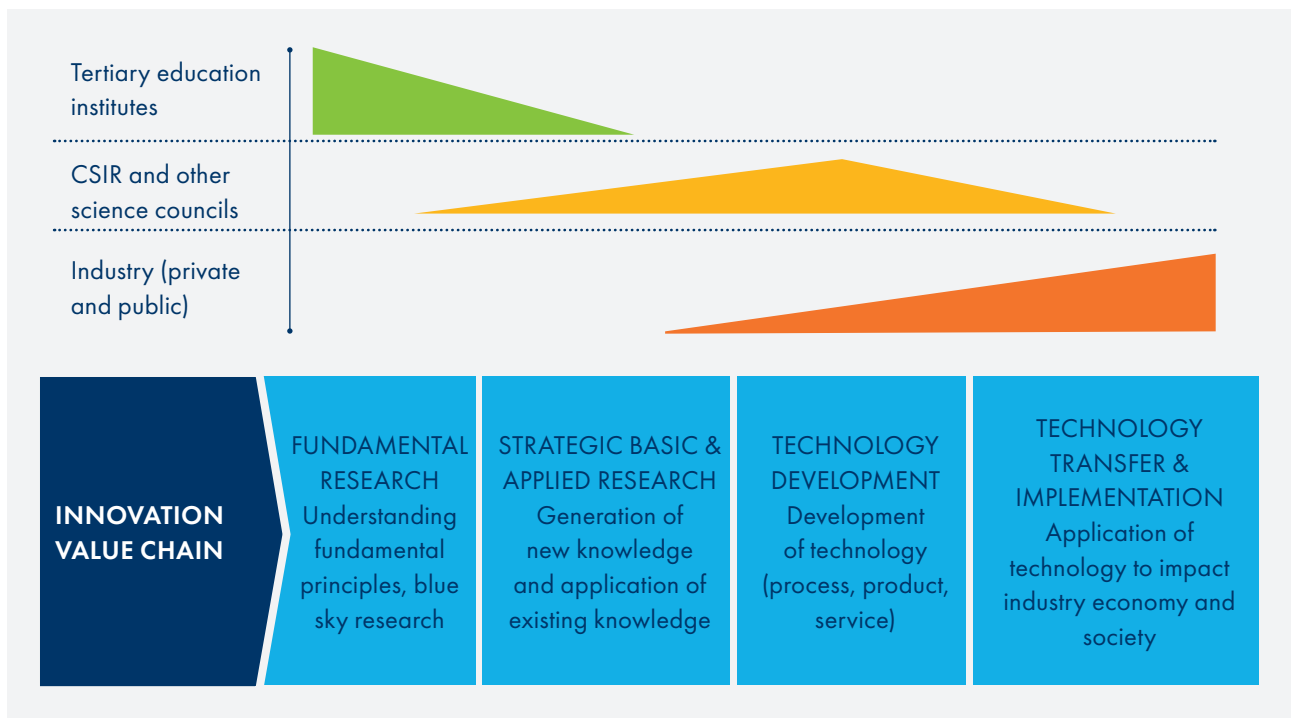
Figure A3: CSIR Values



A.1.4 CSIR ROLE IN THE INNOVATION VALUE CHAIN

The CSIR plays a pivotal role in South Africa’s National System of Innovation (NSI) by bridging the gap between fundamental research and practical application. The CSIR conducts directed research, focusing on the development of transformative technologies that address national priorities. By collaborating with tertiary education institutes, other science councils, and industry partners, the CSIR ensures that new knowledge and technological advancements are effectively translated into practical solutions that benefit the economy and society. This collaborative approach enhances the country’s innovation capacity and supports the development of a capable state. Ideally, the mandate of the CSIR should be enhanced so that it is the designated entity to support the science, technology and innovation requirements for all of Government. In addition, given the nature and depth of the capabilities at the CSIR, it should be mandated and enabled to conduct translational research for all intellectual property emanating from publicly-funded research and development.

Figure A4: CSIR role in the innovation value chain



Moreover, the CSIR is instrumental in technology transfer and implementation, ensuring that innovations are commercialised and adopted by industry. Through initiatives like joint technology development, licensing and custom solution development, the CSIR fosters industrial growth and competitiveness. CSIR C³, a standalone enterprise, is dedicated to driving the commercialisation of the CSIR’s technology by providing financial resources, technical support and an incubator environment for start-ups. This initiative aims to foster collaboration with investors, entrepreneurs, and innovators, playing a pivotal role in catalysing the re-industrialisation of South Africa through new technology-based enterprises. The organisation also supports human capital development by partnering with higher education institutions and government departments to co-invest in skills development. The CSIR’s involvement spans the entire innovation value chain, from fundamental research to technology development and commercialisation, ensuring that each stage contributes to socioeconomic transformation and the sustainability of South Africa’s industrial and scientific advancements.

A.2 STRATEGY 2026/27 – 2030/31

The CSIR Strategy for 2026/27 – 2030/31 is shaped by key global and regional trends, national imperatives and priorities.

A.2.1 POLITICAL CONTEXT

The global political environment in 2025 is increasingly volatile, shaped by shifting trade policies, fiscal interventions, and legal uncertainties resulting in market instability, disrupted supply chains, and heightened trade unpredictability. Geopolitical flashpoints continue to drive economic risk, with commodity prices rising due to perceived threats rather than actual supply disruptions. Meanwhile, domestic policy shifts in major economies, such as increased protectionism, defence spending and property sector challenges, are reshaping global fiscal and monetary priorities, deepening fragmentation and uncertainty.^{1,2,3}

Africa's political and economic landscape is deeply affected by these global dynamics. The imposition of tariffs and retaliatory trade measures has created uncertainty that undermines investor confidence and suppresses export demand across the continent. Aid reductions from traditional development partners further expose Africa's vulnerability to external shocks. However, the AfDB sees opportunity in this uncertainty, advocating for deeper intraregional trade and accelerated economic diversification through full implementation of the African Continental Free Trade Area (AfCFTA). Domestically, African states face persistent challenges including conflict, insecurity and fiscal governance issues, which constrain development and require institutional strengthening and transparent financial management to build resilience and reduce reliance on volatile external support.⁴

South Africa is not immune from the current global dynamics. The country is expected to deepen cooperation with other BRICS countries and Western partners who remain vital to its trade and investment landscape. South Africa's leadership within the African Union further demands that it champions continental integration and stability. According to the Presidency, South Africa will prioritise engagements that advance national and continental development, maintaining a collaborative approach to navigating geopolitical and economic challenges.⁵

The rise in defence spending and security concerns, globally and within Africa, presents opportunities for the CSIR to expand its work in defence technologies and cybersecurity. By leveraging its expertise in remote sensing, AI, and data analytics, the CSIR can contribute to regional stability and support peacekeeping efforts.

As African nations seek to reduce external dependencies and deepen intraregional trade under the AfCFTA, the CSIR can support this transition by developing technologies that enhance supply chain resilience, smart manufacturing and digital infrastructure. These capabilities are critical for enabling economic diversification and improving competitiveness in a volatile global market.

CSIR can play a pivotal role in supporting South Africa's collaborative R&D initiatives across the Global South, promoting digital sovereignty, and contributing to multilateral efforts to modernise trade and technology governance. In doing so, the CSIR not only strengthens national resilience but also reinforces South Africa's leadership within the African Union and its broader global engagements. The CSIR can act as a neutral knowledge broker, leveraging its credibility to shape cooperative research and innovation initiatives that strengthen continental and global linkages.

1 International Monetary Fund (IMF) (2025). World Economic Outlook (WEO): July 2025. Accessed via <https://www.imf.org/en/Publications/WEO/Issues/2025/07/29/world-economic-outlook-update-july-2025>

2 IMF (2025). WEO: April 2025. Accessed via: <https://www.imf.org/en/Publications/WEO/Issues/2025/04/22/world-economic-outlook-april-2025>

3 International Monetary Fund (IMF) (2025). World Economic Outlook (WEO): July 2025. Accessed via <https://www.imf.org/en/Publications/WEO/Issues/2025/07/29/world-economic-outlook-update-july-2025>

4 The African Development Bank Group (AfDB) (2025). African Economic Outlook (AEO) 2025. Accessed via <https://www.afdb.org/en/knowledge/publications/african-economic-outlook>

5 Ibid.

A.2.2 ECONOMIC CONTEXT

The global economy is expected to grow by 3.0% in 2025 and 3.1% in 2026, slightly above earlier forecasts but still below the pre-pandemic average of 3.7%.⁶ This growth is being driven by temporary factors such as front-loading of trade ahead of anticipated tariff increases, improved financial conditions, and a lower-than-expected effective global tariff rate.⁷ However, these are short-lived drivers, and the IMF warns that as they fade, economies may become more exposed to external shocks. Advanced economies are set for modest growth, while emerging markets continue to outperform. Inflation is easing globally, allowing some central banks to consider rate cuts, though geopolitical tensions and climate-related disruptions remain key risks to stability.^{8,9}

Despite global uncertainty, Africa is showing resilience, with strong growth projected in several economies. Non-resource-intensive countries are leading the way, supported by infrastructure investment, economic diversification, and vibrant private sectors. Resource-rich economies are also improving, though their outlook is tied to commodity demand and geopolitical developments. Tourism-dependent regions face slower growth due to uncertainty in key source markets, while inflation across the continent is expected to decline significantly, aided by improved food supply and climate-resilient agricultural practices. The AfDB emphasises that strategic investment in infrastructure and human capital is beginning to yield tangible development gains.¹⁰

South Africa's growth remains subdued, with projections of 1.0%–1.1% in 2025 and 1.3% in 2026, constrained by structural challenges such as high unemployment, weak productivity, poor infrastructure and policy uncertainty.¹¹ While easing load-shedding and improved external conditions offer some relief, environmental pressures, particularly water scarcity, pose significant risks to key sectors. Inflation is expected to ease to 3.4% in 2025, allowing for monetary policy loosening, but domestic demand remains weak. Trade disruptions, such as reduced vehicle exports due to tariff hikes, highlight the vulnerability of key sectors such as vehicle exports. However, aligning exports with global sustainability trends and emerging demand for critical minerals could unlock significant economic opportunities and support job creation. PwC notes that new opportunities are emerging Europe's Carbon Border Adjustment Mechanism (CBAM) will require exporters to adapt to stricter carbon rules, while countries driving investment in AI, robotics, and clean energy are creating fresh demand for South African minerals such as manganese and platinum. Similarly, increased investment in hydrogen and advanced electronics could lift demand for platinum group metals.¹²

Climate resilience and water security present a critical area for CSIR intervention. With South Africa facing severe water scarcity and nearly half of its water systems underperforming, the CSIR can lead in developing smart water management technologies, climate modeling tools and early warning systems. By supporting municipalities and industries with water risk assessments and infrastructure diagnostics, the CSIR can help mitigate climate-related risks and improve long-term sustainability.

Infrastructure innovation is another area where the CSIR can make a significant impact. Poor infrastructure remains a major constraint to growth in South Africa. The CSIR can leverage remote sensing, IoT and data analytics to assess and monitor infrastructure health, while advancing materials science for climate-resilient construction. These efforts can support smarter urban planning and the development of sustainable cities.

6 International Monetary Fund (IMF) (2025). World Economic Outlook (WEO): July 2025. Accessed via <https://www.imf.org/en/Publications/WEO/Issues/2025/07/29/world-economic-outlook-update-july-2025>

7 Ibid.

8 OECD (2025) OECD Economic Outlook, Interim Report September 2025. Accessed via https://www.oecd.org/en/publications/oecd-economic-outlook-interim-report-september-2025_67b10c01-en.html

9 The African Development Bank Group (AfDB) (2025). African Economic Outlook (AEO) 2025. Accessed via <https://www.afdb.org/en/knowledge/publications/african-economic-outlook>

10 Ibid.

11 OECD (2025) OECD Economic Outlook, Interim Report September 2025. Accessed via https://www.oecd.org/en/publications/oecd-economic-outlook-interim-report-september-2025_67b10c01-en.html

12 Ibid.

In agriculture, the CSIR has an opportunity to support climate-smart farming practices that reduce inflationary pressures and improve food security. This includes precision agriculture, drought-resistant crops and soil health technologies. By collaborating with agri-tech startups and digitising value chains, the CSIR can help build more resilient and productive food systems.

Trade competitiveness is increasingly tied to sustainability and innovation. With global shifts towards green policies and strategic mineral demand, the CSIR can support exporters in meeting new standards such as Europe's CBAM. Developing sustainability certification tools, traceability platforms, and beneficiation technologies for critical minerals such as platinum and manganese can position South Africa as a key player in the global green economy.

A.2.3 SOCIAL CONTEXT

Globally, societies are navigating a period of heightened uncertainty and transformation. The lingering effects of the Covid-19 pandemic, combined with new trade wars and geopolitical tensions, have exacerbated social inequalities and strained social safety nets. Many advanced economies are experiencing demographic shifts, with aging populations putting pressure on pension systems and healthcare, while emerging and developing economies face youth bulges and high unemployment. The cost-of-living crisis, persistent inflation and slow wage growth have widened income gaps and fueled social discontent in developed and developing countries.^{13, 14}

Africa's social landscape is characterised by resilience and persistent challenges. The continent remains home to the majority of the world's extreme poor, with poverty rates still high and inequality widespread. Youth make up more than 60% of Africa's population, presenting a demographic dividend and a risk, as high youth unemployment and underemployment threaten social stability. Education and health outcomes have improved in some countries, but progress is uneven and often insufficient to meet the needs of rapidly growing populations. Social protection systems are generally weak, leaving many vulnerable to shocks such as food price spikes, climate disasters and conflict. Migration, within Africa and outward, remains significant, driven by economic opportunity, insecurity and environmental pressures. Despite these challenges, African societies have shown remarkable adaptability, with strong informal networks, community-based support systems and a growing emphasis on gender inclusion and youth empowerment. However, the slow pace of socioeconomic transformation and the impact of global shocks continue to test the continent's social fabric.¹⁵

South Africa's social context is marked by persistent inequalities, high unemployment and ongoing social tensions. Unemployment remains critically high, over 32% overall and above 45% for youth. Service delivery challenges in water, electricity and housing, combined with high crime rates have eroded public trust in institutions and government. While South Africa boasts a vibrant civil society, strong legal protections and a history of activism, the legacy of apartheid continues to shape spatial, economic and social divides. Social protection programmes, such as grants and free basic services, provide important support but are under strain from fiscal pressures. Despite these obstacles, South Africans continue to demonstrate resilience, innovation and a strong commitment to democratic values and social justice.^{16, 17}

For the CSIR, this environment underscores the urgency of focusing research and innovation on solutions that directly address these structural issues. The CSIR's work in affordable housing, water and sanitation and digital access is not just relevant but essential for reducing service delivery gaps and supporting marginalised communities. The high rate of youth unemployment and skills mismatch further highlight the need for the CSIR to strengthen partnerships with universities, TVET colleges and industry to develop and scale up STEM skills. By developing training programmes, internships, and innovation hubs, the CSIR can help prepare young people for employment in emerging sectors such as renewable energy, advanced manufacturing and digital technologies.

13 IMF (2025). WEO: April 2025. Accessed via: <https://www.imf.org/en/Publications/WEO/Issues/2025/04/22/world-economic-outlook-april-2025>

14 OECD (2025), OECD Economic Outlook, Volume 2025 Issue 1: Tackling Uncertainty, Reviving Growth, OECD Publishing, Paris, Accessed via https://www.oecd.org/en/publications/2025/06/oecd-economic-outlook-volume-2025-issue-1_1fd979a8.html

15 African Development Bank Group (2025). African Economic Outlook. Accessed via <https://www.afdb.org/en/documents/african-economic-outlook-2025>

16 Ibid.

17 Ibid.

Ongoing challenges in infrastructure such as water, electricity and transport create opportunities for the CSIR to provide applied research and technical solutions. The CSIR's expertise in smart infrastructure, energy systems and water management is directly relevant to improving the reliability and efficiency of public services, which is critical for social stability and economic growth. At the same time, with social protection systems under strain and fiscal space limited, there is a need for cost-effective, scalable innovations. The CSIR can contribute by developing technologies and systems that improve the efficiency of social grant delivery, healthcare, and education, ensuring that limited resources have maximum impact.

By involving communities and stakeholders in co-designing solutions and communicating the impact of its work, the CSIR can help rebuild trust in science and public institutions. The CSIR must ensure that its research agenda is inclusive and responsive to the needs of all communities. This includes supporting women and underrepresented groups in STEM and ensuring that innovations are accessible and relevant to rural and township economies.

Finally, given the country's exposure to climate risks and social shocks, the CSIR's work in climate adaptation, disaster risk reduction and resilient infrastructure is increasingly important. The CSIR can support government and industry in building systems that are robust in the face of environmental and social challenges.

A.2.4 TECHNOLOGICAL CONTEXT

AI and digitalisation are rapidly transforming the global economy, driving productivity and innovation across sectors. The IMF notes that AI-producing industries in the United States of America (USA) have quadrupled in value since 2010¹⁸, while McKinsey highlights AI as a foundational amplifier across 13 frontier technologies (Figure A5), including agentic AI, energy and sustainability technologies, future of mobility and digital trust and cybersecurity, just to name a few.¹⁹ However, this growth comes with increased energy demands and carbon emissions, making investments in renewable energy and digital infrastructure essential.²⁰ In Africa, the AfDB reports that digitalisation is improving governance and financial inclusion, with mobile money and e-government platforms leading the way.²¹

Despite these opportunities, the 2025 World Economic Forum (WEF) Global Risks Report warns of significant technology-related threats. These include the spread of AI-generated misinformation, algorithmic bias, cyber insecurity and the loss of control over autonomous systems. The report also highlights the risks of surveillance, digital abuse and the misuse of frontier technologies such as geoengineering, brain-computer interfaces, quantum computing and biotechnology. South Africa's Executive Opinion Survey results reflect local concerns, with energy shortages, unemployment, water scarcity, poverty, and economic downturn identified as top risks. These findings underscore the need for tailored national strategies that address global and local vulnerabilities.²²

To maximise the benefits of digital transformation while mitigating its risks, coordinated policy action is essential. The IMF and WEF recommend robust digital infrastructure, workforce reskilling and international cooperation on digital standards and cybersecurity. For Africa, the AfDB stresses the importance of harmonised regulations, investment in digital skills and public-private partnerships to support innovation and inclusion. Business leaders are encouraged to identify relevant technology trends, invest in talent and infrastructure and adopt responsible innovation practices to ensure that digital progress is scalable and equitable.

18 IMF (2025). WEO: April 2025. Accessed via: <https://www.imf.org/en/Publications/WEO/Issues/2025/04/22/world-economic-outlook-april-2025>

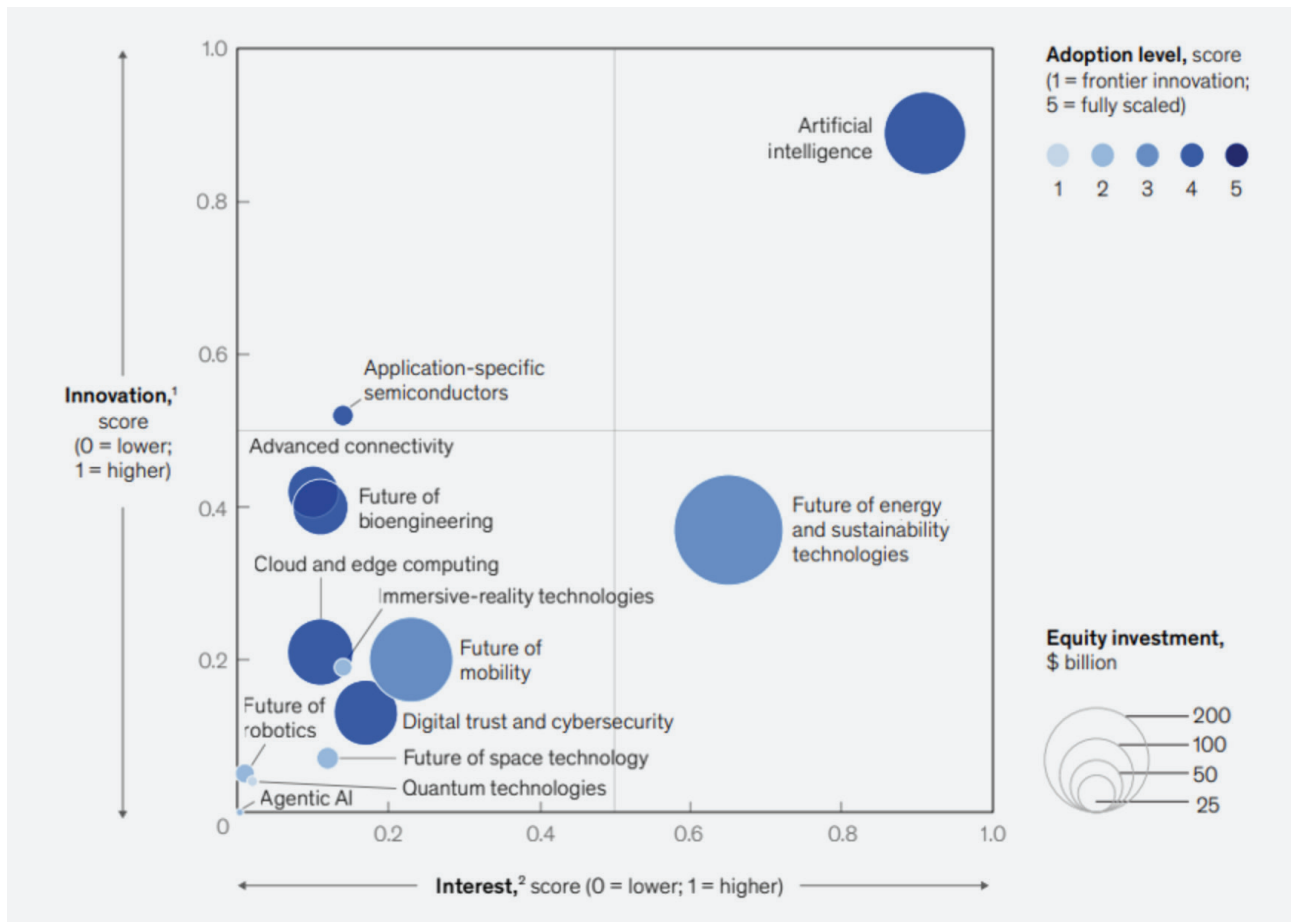
19 McKinsey Digital (2025). McKinsey Technology Trends Outlook 2025. Accessed via <https://www.mckinsey.com/capabilities/mckinsey-digital/our-insights/the-top-trends-in-tech#/>

20 IMF (2025). WEO: April 2025. Accessed via: <https://www.imf.org/en/Publications/WEO/Issues/2025/04/22/world-economic-outlook-april-2025>

21 African Development Bank Group (2025). African Economic Outlook. Accessed via <https://www.afdb.org/en/documents/african-economic-outlook-2025>

22 WEF (2025). Global Risks Report 2025, Accessed via <https://www.weforum.org/publications/global-risks-report-2025/>

Figure A5: Top 13 technology trends for 2025 scored based on its level of innovation, interest, equity



The insights from the IMF, WEF, and McKinsey reports present opportunities for the CSIR as a national science and technology leader. With AI and digitalisation driving global productivity and innovation, the CSIR is well-positioned to spearhead South Africa’s efforts in developing advanced digital infrastructure, AI capabilities, and energy-efficient technologies. This includes investing in agentic AI research, supporting smart grid development, and enhancing water and energy resource management; areas that directly address South Africa’s top risks such as energy shortages, unemployment, and water scarcity.

As AI reshapes labour markets and cybersecurity threats intensify, the CSIR can play a pivotal role in workforce reskilling and digital trust. By collaborating with academic institutions and government, the CSIR can help design and implement AI literacy programmes, promote STEM education, and expand its cybersecurity research to safeguard critical infrastructure. Moreover, the CSIR’s expertise in data analytics and modelling can support evidence-based policymaking, helping national and local governments respond to region-specific risks identified in the WEF Executive Opinion Survey.

Finally, the CSIR has a strategic opportunity to strengthen South Africa’s position in global technology governance. By engaging in international standard-setting, fostering regional innovation partnerships, and aligning local R&D with global best practices, the CSIR can ensure that South Africa not only keeps pace with frontier technologies but also contributes to shaping their responsible and inclusive deployment. In doing so, the CSIR can act as a bridge between science, policy, and industry; driving sustainable innovation that benefits all sectors of society.

A.2.5 ENVIRONMENTAL CONTEXT

Climate change presents an urgent global challenge, with institutions like the Organisation for Economic Co-operation and Development (OECD) and the IMF emphasising the need for bold fiscal and policy reforms to mitigate environmental degradation and support sustainable growth.²³ Key strategies include reducing fossil fuel subsidies, expanding carbon pricing, and increasing investment in renewable energy and green infrastructure.^{24,25} These measures are not only essential for reducing emissions but also for generating the fiscal space needed to fund climate-related initiatives. Multilateral cooperation and technology transfer to emerging economies are critical to ensuring a just and inclusive transition to low-carbon development.

Africa faces unique challenges and opportunities in the green transition. The AfDB highlights the continent's vast natural capital, forests, minerals, water and biodiversity, as a foundation for sustainable development, provided it is managed responsibly. However, climate-related disasters such as droughts and floods pose significant risks to agriculture, food security and livelihoods. Despite substantial climate financing needs, actual flows remain insufficient. To close this gap, African countries must scale up investment in climate-smart agriculture, resilient infrastructure, and renewable energy, while strengthening environmental governance, transparency and regional cooperation.²⁶

South Africa's Just Energy Transition (JET) offers a model for inclusive climate action. Through its JET Investment Plan and Climate Change Response Fund, the country is working to ensure that the shift away from fossil fuels supports vulnerable communities and aligns with international climate goals. The Presidential Climate Commission's framework emphasises resource mobilisation, sectoral climate resilience, and support for workers affected by the transition. By integrating climate policies into broader economic strategies and prioritising social justice, South Africa demonstrates how national leadership can drive a fair and effective green transition.²⁷

The CSIR's capabilities are well-positioned to play a pivotal role in advancing the country's climate resilience and green transition. With its existing expertise in climate services, renewable energy, and infrastructure planning, the CSIR can expand its support to government and industry by scaling up climate modelling tools, developing sector-specific adaptation strategies, and enhancing platforms like the Green Book and the South African Risk and Vulnerability Atlas. These tools are critical for helping municipalities and businesses understand and respond to climate risks, particularly in vulnerable sectors such as agriculture, water, and urban development.

In alignment with South Africa's JET Plan and broader OECD and AfDB recommendations, the CSIR can accelerate innovation in the systems. This includes supporting local manufacturing of green technologies, promoting climate-smart infrastructure, and integrating nature-based solutions into urban planning. The CSIR's analytical capabilities also offer valuable support for fiscal policy reform, including carbon pricing, environmental taxation, and emissions tracking, which are essential for funding climate-related investments and achieving national climate goals.

Furthermore, the CSIR has the opportunity to strengthen its role in regional and international partnerships by leading climate innovation hubs, facilitating technology transfer across Africa, and supporting South Africa's commitments to the UN Sustainable Development Goals and COP targets. By investing in capacity building, digitising environmental governance tools, and promoting inclusive climate policies, the CSIR can help ensure that South Africa's transition to a low-carbon economy is effective and equitable. These strategic opportunities not only align with national priorities but also position the CSIR as a key driver of sustainable development across the continent.

23 OECD (2024), OECD Economic Outlook, Volume 2024 Issue 1: An unfolding recovery, OECD Publishing, Paris, Accessed via <https://doi.org/10.1787/69a0c310-en>

24 OECD (2025), OECD Economic Outlook, Volume 2025 Issue 1: Tackling Uncertainty, Reviving Growth, OECD Publishing, Paris, Accessed via https://www.oecd.org/en/publications/2025/06/oecd-economic-outlook-volume-2025-issue-1_1fd979a8.html

25 Ibid.

26 African Development Bank Group (2025). African Economic Outlook. Accessed via <https://www.afdb.org/en/documents/african-economic-outlook-2025>

27 The Presidency (2025). APP 2025/26. Accessed via <https://www.presidency.gov.za/sites/default/files/2025-05/Annual%20Performance%20Plan%202025-26.pdf>

A.2.6 LEGAL/POLICY CONTEXT

South Africa's legal and institutional framework is among the most advanced in Africa, providing a strong foundation for economic development and investment. The country's Constitution enshrines the rule of law, separation of powers, and protection of property rights, while an independent judiciary and specialised commercial courts ensure contract enforcement and dispute resolution. South Africa has also modernised its legal environment through digital reforms, such as the Electronic Communications and Transactions Act, which recognises digital contracts and supports a dynamic business environment.²⁸

Public financial management is governed by strong laws such as the PFMA, and the country has adopted integrated financial management systems and performance-based budgeting to enhance transparency and accountability.²⁹

South Africa's approach to natural resource governance, financial sector regulation, and business environment is also grounded in a solid legal framework. The state owns mineral and petroleum resources, managed under the Mineral and Petroleum Resources Development Act, with transparent licensing and environmental obligations. The financial sector is regulated by independent authorities, supporting deep capital markets and investor protection. While the legal environment supports business operations and property rights, challenges remain, including regulatory complexity, policy uncertainty, and the need for further reforms to address inequality and improve public service delivery. Continued vigilance and reform are necessary to fully realise the benefits of South Africa's legal and institutional strengths.³⁰

The Medium-Term Development Plan (MTDP) 2024–2029 sets out South Africa's strategic priorities for the 7th Administration, focusing on inclusive economic growth and job creation, optimising the social wage, and building a capable, ethical, and developmental state. It proposes structural reforms to address persistent challenges such as low GDP growth, high unemployment, poverty, and inequality. Key interventions include infrastructure development, support for small enterprises, professionalising the public service and strengthening law enforcement. The CSIR contributes to these goals by leveraging its industry-oriented capabilities and commercialisation efforts to support entrepreneurs and innovation.

Complementing the MTDP, the Economic Reconstruction and Recovery Plan (ERRP) and the National STI Policy and Decadal Plan aim to stabilise and transform the economy post-Covid-19. While the ERRP has helped restore pre-pandemic economic levels, challenges like energy shortages and logistics inefficiencies persist. Recommendations include improving implementation and monitoring frameworks. The STI Decadal Plan supports long-term development through innovation in key sectors, digital and circular economies and solutions to societal challenges such as climate change and education. The CSIR's strategic responses align with all three frameworks, reinforcing its role in driving inclusive growth, state capability and social development through science and technology.

28 African Development Bank Group (2025). African Economic Outlook. Accessed via <https://www.afdb.org/en/documents/african-economic-outlook-2025>

29 Ibid.

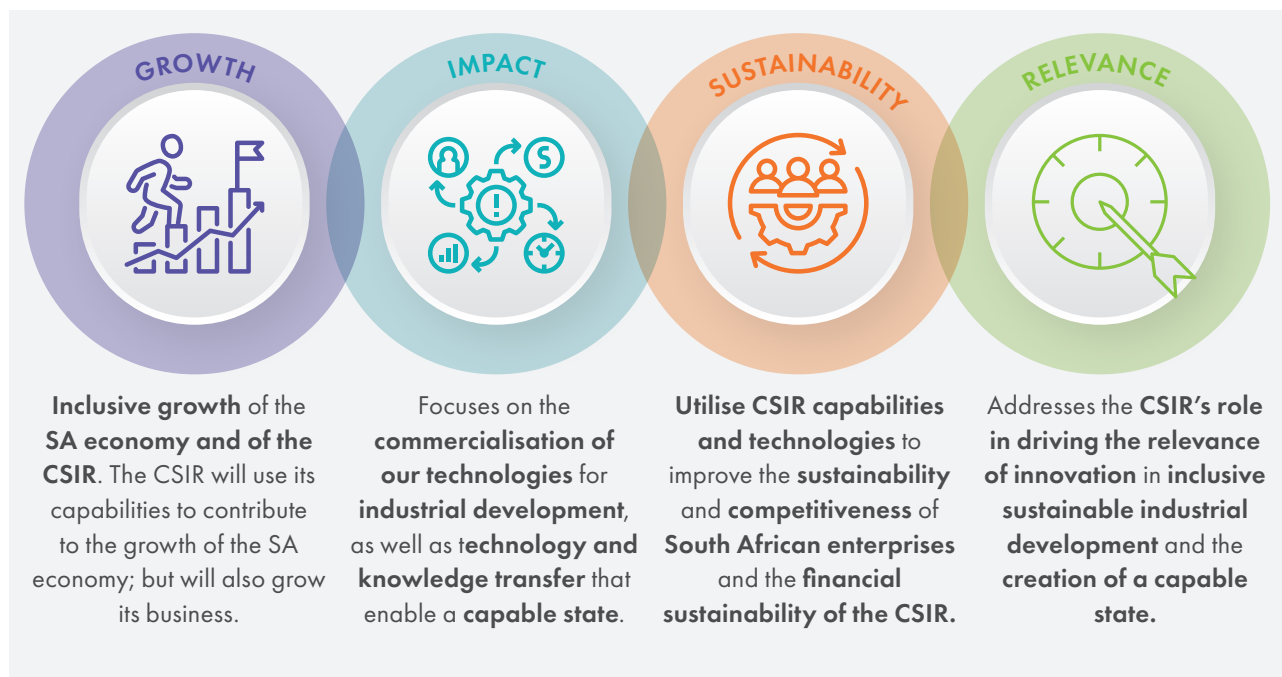
30 Ibid.

A.2.7 CSIR STRATEGY

The CSIR strategy is focused on the development, maintenance and application of SET capabilities for the inclusive growth of the South African economy, improving the performance of industry and supporting the creation of a capable state.

A.2.8 CSIR'S IMPACT STATEMENT

Figure A6: CSIR's Impact Statement

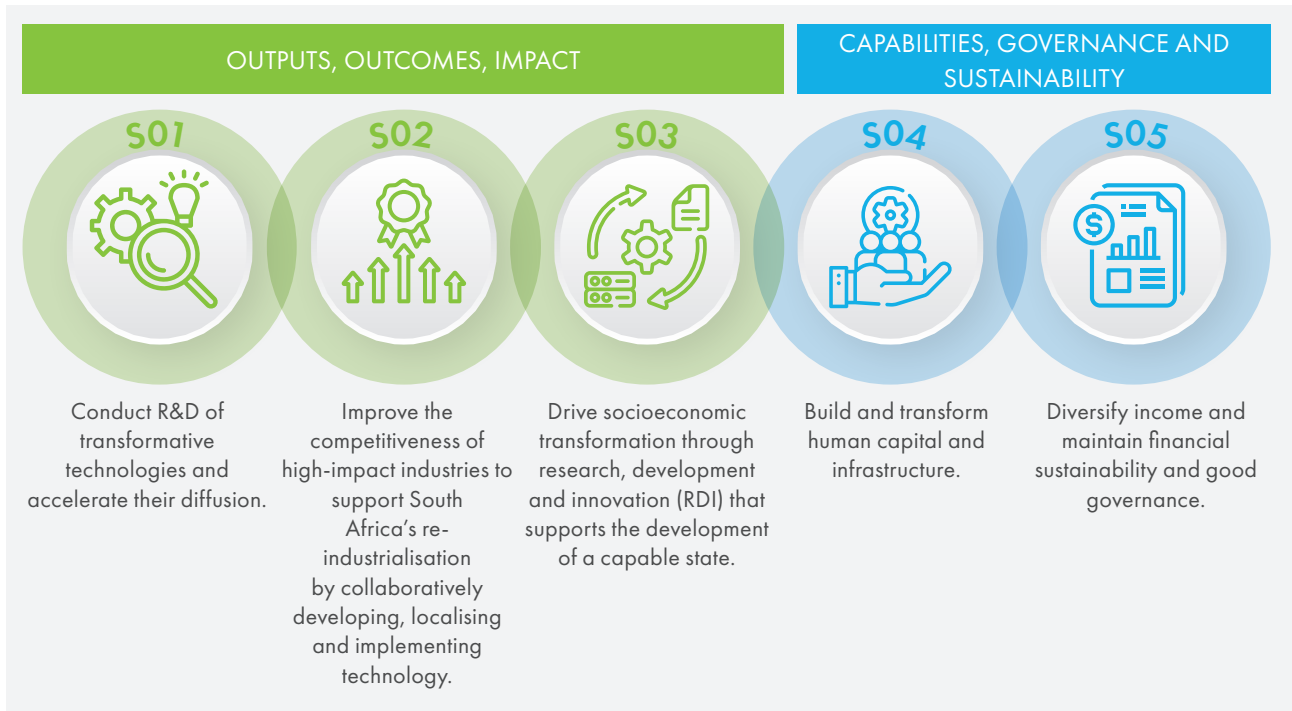


A.2.9 STRATEGIC OBJECTIVES

The CSIR's strategic objectives (SOs) are designed to drive transformative RD&I that supports South Africa's reindustrialisation and socioeconomic transformation. The first objective focuses on conducting RD&I of transformative technologies and accelerating their diffusion to ensure that cutting-edge innovations are effectively implemented. The second objective aims to improve the competitiveness of high-impact industries, thereby supporting South Africa's reindustrialisation efforts and enhancing the country's global economic standing.

Additionally, the CSIR aims to drive socioeconomic transformation through RD&I that supports the development of a capable state, ensuring that technological advancements contribute to broader societal benefits. Another key objective is to build and transform human capital and infrastructure, ensuring a continuous pipeline of skilled professionals and robust infrastructure to support industrial development. Finally, the CSIR seeks to diversify its income streams and maintain financial sustainability and good governance, ensuring the organisation's long-term viability and effectiveness in achieving its mission. Together, these strategic objectives position the CSIR as a key driver of innovation, industrial growth and socioeconomic development in South Africa. We measure the achievement of these SOs through the balanced score card illustrated in Tables 1 (pages 10-11) and A8 (pages 73-74) where key performance indicators and associated targets are detailed.

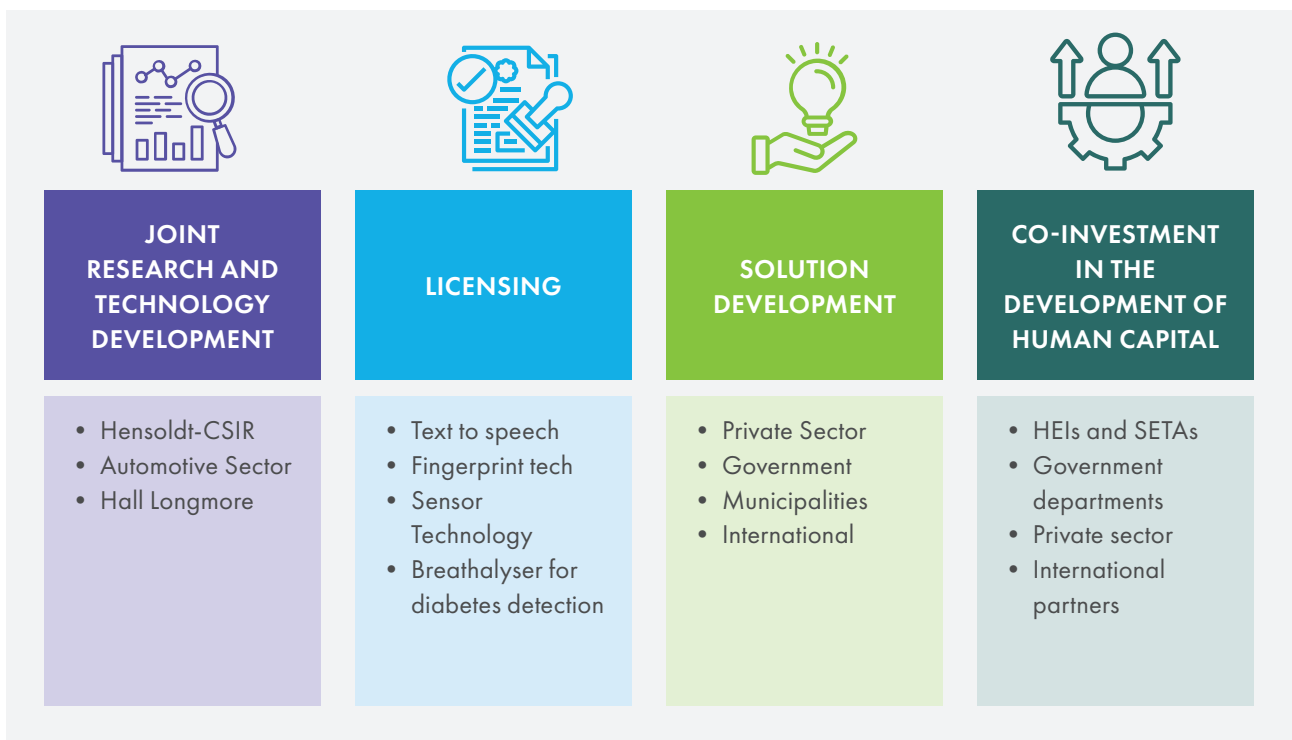
Figure A7: CSIR's Strategic Objectives



A.2.10 COLLABORATION MODEL

The CSIR's collaboration model is designed to drive innovation and technological advancement through strategic partnerships and joint initiatives. This model includes joint technology development with industry partners. Additionally, the CSIR licenses its technologies, enabling the commercialisation of innovations. By working with private sector companies, government bodies, municipalities and international partners, the CSIR develops tailored solutions that have a direct and positive impact on society and industry.

Figure A8: The CSIR's collaboration model

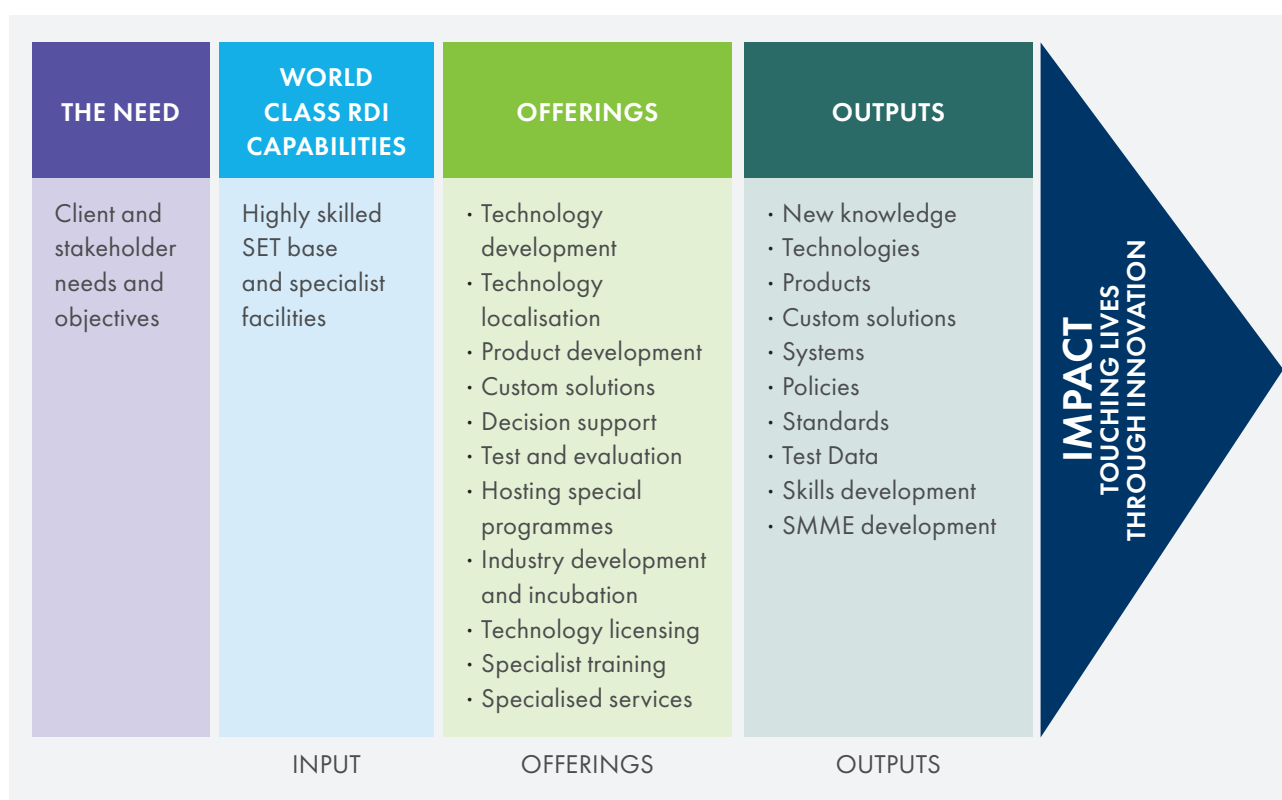


Furthermore, the CSIR invests in human capital development through partnerships with higher education institutions, SETAs, government departments and international organisations. This co-investment ensures a continuous pipeline of skilled professionals to support industrial and technological growth. Overall, the CSIR’s collaboration model ensures that research and innovations are effectively translated into practical applications, fostering industrial growth, enhancing competitiveness and contributing to South Africa’s socioeconomic development.

A.2.11 CSIR BUSINESS MODEL

The CSIR’s business model is centred on conducting contract RD&I to meet the objectives of its clients and stakeholders. This model involves a comprehensive process that begins with identifying clients and stakeholders needs, leveraging world-class RD&I capabilities to develop technologies, products and customised solutions. The CSIR’s offerings include technology development, technology localisation, product development, custom solutions, decision support, testing and evaluation, hosting special programmes, industry development and incubation, technology licensing and specialised training. The outputs of these activities includes new knowledge, technologies, products, systems, policies, standards, test data, skills development and support for SMMEs.

Figure A9: The CSIR’s business model

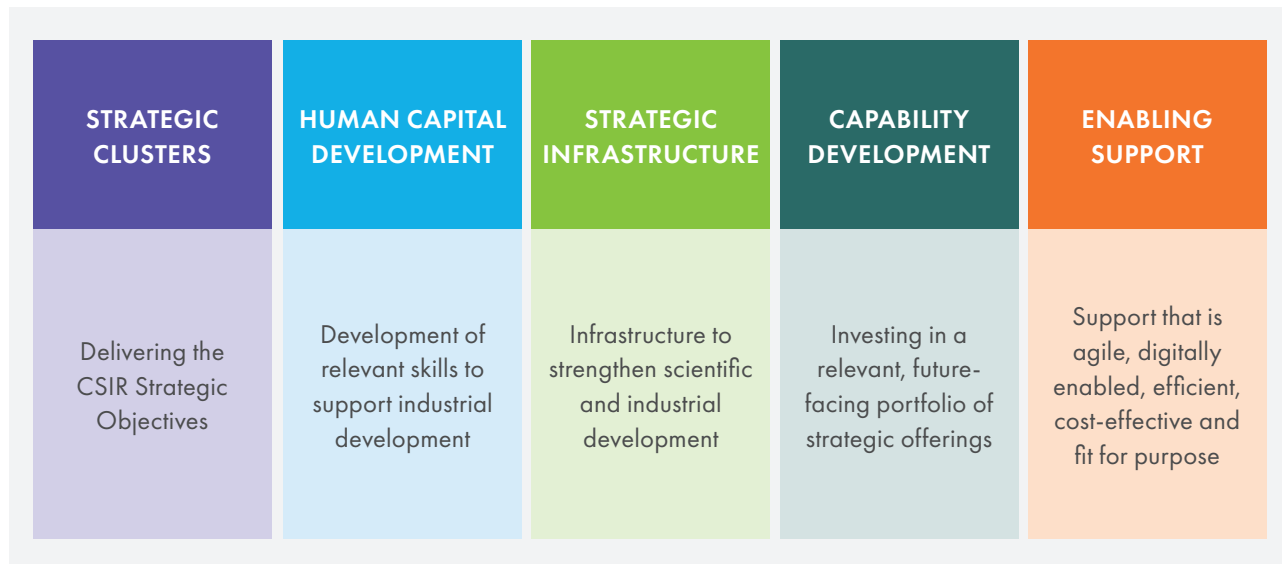


Additionally, the CSIR’s business model emphasises collaboration and commercialisation. The organisation engages in joint technology development with industry partners, licenses its technologies to various entities and develops tailored solutions for the private sector, government, municipalities and international partners. The CSIR also co-invests in human capital development with higher education institutions, SETAs, government departments and international organisations. This collaborative approach ensures that the CSIR’s innovations are effectively translated into practical applications, fostering industrial growth, enhancing competitiveness and contributing to the socioeconomic development of South Africa.

A.2.12 PILLARS OF CSIR STRATEGY IMPLEMENTATION

The CSIR's strategy implementation is built on five key pillars designed to drive its strategic objectives and ensure impactful outcomes. The first pillar, Strategic Clusters, focuses on delivering the CSIR's strategic objectives through specialised clusters that address various industry and societal needs.

Figure A10: Pillars of the CSIR strategy implementation



The second pillar, Human Capital Development, emphasises the development of relevant skills to support industrial development, ensuring a continuous pipeline of qualified professionals. The third pillar, Strategic Infrastructure, aims to strengthen scientific and industrial development through the establishment and maintenance of essential infrastructure. The fourth pillar, Capability Development, involves investing in a relevant and future-facing portfolio of strategic offerings, ensuring that the CSIR remains at the forefront of technological innovation and research. Finally, the fifth pillar, Enabling Support, ensures that the CSIR's operations are agile, digitally enabled, efficient, cost-effective and fit for purpose, providing the necessary support for the organisation to achieve its goals. Together, these pillars create a robust framework for the CSIR to drive innovation, industrial growth and socioeconomic development in South Africa.

A.2.12.1 STRATEGIC CLUSTERS

The CSIR's operating model considered organisational design best practices applied by other research and technology organisations and service-offering firms. The CSIR strategy responds to national priorities and initiatives, and in defining the strategy, an in-depth socioeconomic and technical analysis led to the identification of the sectors that (1) have the potential to increase GDP and create jobs and (2) could benefit from advancements in technological innovation to improve their competitiveness. Clusters are defined as interfaces between sectors of the economy and technology. Nine strategic clusters through which the CSIR can make the greatest impact were identified – these form the backbone of the strategy and constitute the RD&I-performing components of the CSIR operating model.

Figure A11: The CSIR's strategic clusters



The CSIR's strategic clusters are designed to drive South Africa's industrialisation and address key national priorities through focused research and innovation. There are six industry advancement clusters, namely Advanced Agriculture and Food; Future Production clusters comprising Chemicals, Manufacturing and Mining; NextGen Health; and Defence and Security. The other three clusters (Smart Places, Smart Mobility and NextGen Enterprises and Institutions) are industry and society-enabling clusters.

Each cluster is managed by an Executive Cluster Manager (ECM) and the ECMs report to a Divisional Group Executive who is a member of the CSIR Executive Committee; there are three divisions. The Advanced Chemistry and Life Sciences division aims to strengthen local industries by developing advanced products, processes and materials, particularly in pharmaceuticals and chemicals. The Advanced Production and Security division focuses on enhancing manufacturing competitiveness through digital transformation and 4IR technologies, supporting the mining industry's growth, and building resilient defence and security capabilities. The Smart Society division works on enabling smarter natural resource use, environmental sustainability and smart infrastructure, as well as improving agricultural production and processing.

The strategic clusters focus on strengthening local industries, enhancing health security, promoting environmental sustainability, improving transport and logistics, enabling digital transformation and supporting the growth and revitalisation of the mining industry. Together, these strategic clusters ensure that the CSIR's research and innovation efforts are aligned with national priorities, fostering industrial growth, enhancing competitiveness and contributing to socioeconomic development.

FUTURE PRODUCTION: CHEMICALS

The CSIR Future Production: Chemicals cluster develops sustainable, state-of-the-art and innovative biological and chemical conversion technologies, materials, and products to support a vibrant and circular South African chemicals and pharmaceuticals industry. The cluster focuses on (i) Sustainable chemical production processes, (ii) Nanostructures and advanced materials development, and (iii) Pharmaceutical process innovation. The cluster has a Centre for Nanostructures and Advanced Materials, a Biomanufacturing Technology Impact Area, and a Pharmaceutical Technology Innovation Platform. These areas are complemented by industrial facilities and programmes such as the Biomanufacturing Industry Development Centre (BIDC), the Biorefinery Industry Development Facility (BIDF) and the Nanomaterials Industrial Development Facility (NIDF) together with the Industrial Biocatalysis Hub (IBH), Supercritical CO₂ Encapsulation Pilot Plant, the Coega-based Fibre Hub and Nano-Micro Manufacturing Facility, which are focused on providing technical support to the benefit of local industry.

The CSIR Future Production: Chemicals cluster's strengths lie in its robust industry-facing facilities, highly skilled and collaborative staff and well-established research platforms, particularly in Biomanufacturing Technology and the Centre for Nanostructures and Advanced Materials. The cluster is recognised for its capacity to support innovation through advanced pilot-scale infrastructure, and its reputation for fostering partnerships across public, private, and international sectors. These strengths position the cluster as a leader in driving sustainable chemical innovation, supporting localisation, and enabling the development of ESG compliant products and advanced materials for the chemical and health industries.

Challenges and opportunities in the chemicals sector

South Africa's chemicals sector is being shaped by significant geopolitical and economic shifts. The country's deepening ties with China and its influential role within an expanded BRICS alliance are opening new opportunities for research, investment, and standard-setting, while also presenting diplomatic complexities. South Africa's non-aligned stance allows the CSIR to act as a neutral innovation broker, leveraging partnerships with the EU (for regulatory alignment and funding) and China (for industrial capacity), and positioning itself as a continental leader in industrial transformation and commercialisation.

The chemicals industry is under increasing pressure to meet global ESG standards. Multinational companies must decarbonise supply chains and adopt circular manufacturing practices, with EU regulations such as "Registration, Evaluation, Authorisation and Restriction of Chemicals" and the Green Deal tightening import standards. At the same time, the AfCFTA is accelerating demand for localised production of specialty chemicals, fertilisers, and green solvents. China's investments in mineral beneficiation and agro-processing across Africa are creating new demand for scalable chemical platforms and local partners. The CSIR's pilot-scale infrastructure for green chemistry, biodegradable polymers and low-carbon solvents positions it as a regional leader in ESG-compliant manufacturing.

Technology trends are rapidly transforming the sector, with advances in AI-driven biologic design, precision medicines, 3D-bioprinting, and synthetic biology. There is a strong push for decarbonisation technologies, including carbon capture and green hydrogen, as well as circular systems that go beyond waste-to-value to closed-loop manufacturing. The CSIR's work in biodegradable polymers, low-carbon solvents, and industrial waste valorisation aligns with these trends, offering opportunities to position itself as a leader in sustainable chemical innovation. However, commercialisation is challenged by long regulatory lead times, the need for evidence-based validation, and feedstock security. The CSIR can unlock further value by mapping African biodiversity, building digital biobanks, and partnering with industry to validate and scale new technologies.

Chemicals cluster long-term strategic initiatives

- In the **Advanced Materials initiative**, the focus is on developing nanostructures and advanced materials, including polymers, fibres, cosmetics and energy materials. These innovations are aimed at supporting local industries and SMMEs throughout the entire value chain of product development, from research to prototyping;
- The **Biomanufacturing Technologies initiative** supports sustainable chemical production through bioprocessing, biopharmaceuticals, biocatalysis and biorefinery capabilities. It targets SMME and industry support in product development, with a particular focus on skills development both locally and across Africa; and
- The **Just Energy Transition (JET) initiative** focuses on process development and supporting the transition to sustainable energy systems by developing and supporting processes that enable inclusive growth, job creation, and energy security.

The CSIR Advanced Agriculture and Food cluster contributes to enhanced competitiveness of the agricultural industry and the agroprocessing sector and supports rural development and inclusive economic growth. The cluster has three research groups and a hosted programme. The three research groups are i) Agroprocessing, which focuses on the process and product development in the agriculture value chain. It aims to implement advanced agroprocessing technologies to support the competitiveness of agro-based businesses, valorise biodiversity to support socioeconomic development and create new high-value products and support healthy lifestyles through the development of ready-to-eat and highly nutritious products. ii) Precision Agriculture, which focuses on the development of 4IR-based farming practices that can be applied in the analysis of spatial data related to crop productivity and field inputs and real-time monitoring of crop development and anomalies due to variation in soil potential, physical or climatic variables, pest and diseases, or nutrient deficiencies; and iii) Food Safety Programme, which focuses on the development of innovative methods for food safety, quality testing and extending shelf life, with envisioned solutions from farm to folk. The cluster hosts the NEPAD Southern Africa Network for Biosciences (SANBio) programme, a DSTI-funded initiative that provides the cluster and the CSIR access to 12 SADC countries. SANBio is a shared biosciences RD&I platform for working collaboratively to address some of southern Africa's key biosciences issues in health, nutrition and health-related intervention areas such as agriculture and the environment.

The CSIR Advanced Agriculture and Food cluster's strengths lie in its strong alignment with national priorities such as agroprocessing, IKS, aquaculture, the circular economy, and precision agriculture, which continually unlock funding for capability development and infrastructure. The cluster boasts strategic capabilities and a proven track record in agroprocessing, positioning it to play a key role in emerging sectors like cannabis and precision agriculture. Its association with the BDC provides unique facilities to support SMMEs and industry needs, while the established CSIR brand is trusted across public and private sectors. Integrated capabilities with other CSIR clusters enhance its offerings, and the cluster has strong expertise in developing diagnostics for aquaculture and animal health, supported by recently upgraded laboratories and well-established plant-expression systems for recombinant vaccine development in the livestock industry.

Challenges and opportunities in the agricultural sector

South Africa's agriculture sector is experiencing robust growth, with exports increasing by 10% in the first quarter of 2025 and Africa accounting for 45% of these exports. The sector's market size is estimated at \$17.3 billion, with exports contributing 79% to the agricultural GDP in 2024. Agriculture itself contributes 2.8% to the national GDP, while the broader value chain adds up to 7%. The Agriculture and Agroprocessing Master Plan (AAMP) aims to expand the sector's output by R32 billion by 2030, representing a 25% increase from 2021 levels. This positive outlook creates fertile ground for technology and innovation, positioning the CSIR Advanced Agriculture and Food cluster to capture greater market share through expanded offerings such as metabolomics, advanced food processing, and food safety innovations.

Despite the sector's growth, several challenges persist, particularly those highlighted in the Bureau for Food and Agricultural Policy's Baseline Agricultural Outlook 2023–2032. These challenges, such as climate change, require public sector interventions and advanced technologies to ensure sustainable yields. Rising temperatures and changing rainfall patterns threaten productivity, potentially leading to food shortages and higher prices. In response, the CSIR Advanced Agriculture and Food cluster is deploying new technologies and supporting the AAMP's goal of appointing and training 10 000 new extension officers, including those seconded to commodity associations and seed companies. There is also a growing demand for alternative and indigenous foods, with consumers seeking nutritious and supplementary options. The CSIR Advanced Agriculture and Food cluster supports SMMEs and start-ups to help them overcome entry barriers and benefit from the AAMP's target of transforming 20% of the agricultural value chain.

Emerging industries, such as cannabis, present significant opportunities for economic development. The cannabis industry is valued at R27 billion and could create over 130 000 new jobs. The CSIR is actively collaborating with government departments to develop cannabis-based products for SMMEs, aiming to position the CSIR Advanced Agriculture and Food cluster as a leader in this market. Additionally, metabolomics is set to play a crucial role in advancing agro-processing and food innovation by providing advanced analytical capabilities for product quality and safety. Livestock

and aquaculture continue to drive agricultural GDP, with ongoing cluster efforts to develop molecular diagnostics, modern vaccines and therapeutics to support these sectors. These initiatives are designed to protect productivity, reduce losses, and meet demand while minimising the risk of antimicrobial resistance.

Advanced Agriculture and Food cluster long-term strategic initiatives

- A key initiative is the support for **4IR technologies** to aid small-scale farmers. This involves providing actionable farm-level data or intelligence to enable precision agriculture and cost-effective business decisions, such as yield predictions and climate impact modelling. The goal is to increase the efficiency of crop production in the era of climate variability, enhance the contribution of small-to-medium-scale growers, and understand the movement in crop prices, which has implications for food security, profitability, and logistics. This initiative response to the STI-Decadal Plan 2022-2023 on Modernising Agriculture.
- The **agroprocessing initiative** aims to develop complementary medicines, cosmetics, and food products while assisting companies in navigating the IKS regulatory framework to ensure compliance and benefit from commercialising IKS-based products. This initiative also addresses food waste through a circular economy model and post-harvest management technologies, as well as metabolomics for enhanced product quality, safety, and authenticity.
- **The Food Safety Innovations initiative** is dedicated to monitoring unregulated and emerging biological and chemical hazards in food, offering high-end analysis for contaminants, and providing food safety compliance services.

NEXTGEN HEALTH CLUSTER

The CSIR NextGen Health cluster focuses on the improvement of access to healthcare and incorporates synthetic biology and state-of-the-art diagnostic and treatment technology with advances in AI to provide integrated digital health solutions. The cluster has an impact area in Medical Devices, Diagnostics and Vaccines (MDDV), which focuses on the human diagnostics and omics and veterinary molecular diagnostics and vaccines research areas. The MDDV impact area includes a Diagnostics Lab Testing facility. The cluster has a research centre, the Synthetic Biology and Precision Medicine Centre (SynBio Centre) which focuses on bioengineering and integrative genomics, array technology and companion diagnostics, and synthetic nanobiotechnology and bio-machines group research areas.

The cluster has been under administration in the leadership of the CSIR Future Production: Chemicals and CSIR Advanced Agriculture and Food clusters. The CSIR plan for the engagement of the health and pharmaceutical sector is detailed in section A.2.12.6.

Challenges and opportunities in the health and pharmaceutical sector

The health and pharmaceutical sector in South Africa faces several deep-rooted challenges that hinder its growth and ability to serve national needs. One of the most significant issues is the country's overwhelming reliance on imported medicines and active pharmaceutical ingredients (APIs), with about 98% of APIs being sourced from abroad. This dependence exposes South Africa to global supply chain disruptions, price volatility, and shortages, making it difficult to ensure consistent access to essential medicines. Compounding this, the local manufacturing base is weak, with most domestic companies limited to formulation and packaging, and lacking the capacity to produce APIs or advanced biologics.

Another major challenge is the lack of infrastructure and funding to translate research into market-ready products. While South Africa has strong capabilities in early-stage research, there is a critical gap in facilities for clinical-grade manufacturing, process development, and scale-up. This "translational gap" means that many local innovations never reach commercialisation. The situation is exacerbated by declining government investment in health R&D, with most funding directed towards universities and clinical research rather than industrial-scale innovation and manufacturing. Policy and regulatory misalignment further complicate matters, as industrial policy may call for local manufacturing, while health procurement policies often prioritise the lowest cost, favouring imports.

Finally, the sector struggles with skills shortages, market access barriers, and a fragmented innovation ecosystem. There are not enough skilled professionals in areas such as process engineering and regulatory affairs and local manufacturers face difficulties accessing the domestic market due to intense competition from imports and a lack of guaranteed procurement.

Collaboration between universities, science councils, industry, and government is limited, and there is insufficient focus on African-specific research, leading to higher rates of adverse drug reactions in local populations. These challenges collectively limit the sector's ability to innovate, manufacture locally and ensure health sovereignty for South Africa.

CSIR NextGen Health cluster long-term strategic initiatives

- **Vaccine manufacturing and innovation:** This initiative aims to develop local capabilities to manufacture vaccines and biologics. The goal is to establish local capability to manufacture pharmaceuticals originating from local research and development, addressing the current gap in pharmaceutical manufacturing and enhancing pandemic preparedness through the production of protein-based disease countermeasures. This initiative is part of the CSIR's response to the DSTI Decadal Plan.
- **Next-Generation molecular diagnostics:** This initiative focuses on developing and deploying advanced diagnostic technologies to address both human and veterinary health needs. It aims to provide rapid, real-time detection at the PoC setting, thus enabling quick decision-making and better disease management.
- **Development of tools for drug development, personalised medicines and pharmacovigilance:** This initiative involves creating tools for precision cancer treatments, pharmacovigilance and drug development. The goal is to enhance health outcomes and maximise the return on investment for health through patient appropriate treatment, and enabling the regulator to better monitor particular products deployed in our markets.

DEFENCE AND SECURITY CLUSTER

The CSIR Defence and Security cluster aims to drive scientific and technological excellence to secure South Africa, the region and the continent, and advance its industrial and human capital base through the development of strategic defence technologies and capabilities for air, land, sea and cyber defence. The cluster has six impact areas, namely i) Aeronautic Systems; ii) Optronics Sensor Systems; iii) Command, Control and Integrative Systems; iv) Radar and Electronic Warfare; v) Landward Sciences; and vi) Technology for Special Operations; and one research centre, namely the Information and Cybersecurity Centre. The cluster conceptualises and develops novel, innovative and integrated solutions designed and scaled to meet the safety and security needs of civil society and the public sector. Moreover, the cluster provides strategic, world-class cybersecurity RD&I leadership.

The CSIR Defence and Security cluster's strengths lie in its established trust relationships with state entities, a strong track record in Critical Infrastructure Protection Architecture, and significant operational concepts for protecting critical infrastructure. The cluster boasts in-house military technologies that can be repurposed for security, robust collaboration agreements with private security suppliers, and a relevant R&D focus in areas such as computer vision, modeling and simulation, optronic surveillance, and infrared electronic warfare systems. It has qualified and certified cybersecurity experts, a Virtual Security Operations Centre supporting various government entities, and strong government collaborations, including active involvement with SMMEs. Additionally, the cluster benefits from broad technical expertise, a reputable brand legacy, support from SANDF's different arms of service, and access to a wide capability base through partnerships with local and international companies and defence R&D organisations.

Challenges and opportunities in the defence and security sector

South Africa's defence sector is facing significant financial constraints, with defence spending declining for four consecutive years despite global defence budgets reaching record highs. This has shifted the focus from traditional, heavy military platforms to more cost-effective technologies such as sensors, cyber solutions, counter-unmanned aerial systems (C-UAS) and analytics. The SANDF is grappling with capability gaps and funding pressures, while Denel is expected to recover financially by mid-2026. Persistent border and maritime security challenges, along with porous land borders, are driving demand for scalable, sovereign security solutions that can be rapidly deployed.

The country is also experiencing high levels of violent crime and organised infrastructure sabotage, including copper and cable theft and attacks on rail and power systems. These issues are increasing the need for advanced critical-infrastructure protection, forensic technologies, and public safety solutions. At the same time, cyber adversaries are leveraging AI and

emerging technologies to launch sophisticated attacks, expanding the attack surface due to widespread cloud adoption, IoT proliferation, and remote work. South Africa's cybersecurity industry is hampered by a shortage of local skills and heavy reliance on foreign technologies, presenting opportunities for homegrown solutions and capacity building.

Globally, rapid technological shifts, such as the proliferation of commercial drones and the growth of C-UAS markets, are sharpening the need for detection and defeat capabilities, especially at sensitive sites. The changing cyber threat landscape and digital transformation trends offer opportunities for the CSIR to expand its cybersecurity capabilities, develop local solutions in partnership with SMMEs and build strategic alliances with government, industry, and academia to strengthen the national cybersecurity ecosystem and inform policy development.

CSIR Defence and Security cluster long-term strategic initiatives

- **Develop defence technologies** that enhance designated sovereign capabilities and ensure strategic independence: This initiative focuses on establishing research, development, and innovation (RD&I) in fields such as aerodynamic test and evaluation, space, stores integration, air operations, and airborne autonomous systems. It aims to create competitive and innovative national surveillance and situational awareness capabilities.
- Establish a world-class **National Information and Cyber Security capability**: This initiative aims to create a Virtual Security Operation Centre that provides consolidated cybersecurity situational awareness for government, municipalities, the private sector, and the wider African market. It also focuses on developing locally implemented multimodal identity technologies for secure and reliable identity recognition.
- **Building the capabilities to combat crime**: This initiative targets the reduction of various crime-related challenges, including cash-in-transit crimes, cyber/digital crimes, illegal border crossings, illicit mining, infrastructure-related crimes, and social unrest. It also aims to increase interoperability within the security cluster and integrate the CMORE situational awareness platform into operational environments.

FUTURE PRODUCTION: MANUFACTURING CLUSTER

The CSIR Future Production: Manufacturing cluster supports the re-industrialisation of South African industry and is centred around the localisation of key aspects of advanced manufacturing value chains, specifically metal additive manufacturing, injection moulding and casting; product localisation of designated and high-value components, products and equipment; facilitation of access to unique and capital-intensive infrastructure, equipment and tools for SMMEs and digital transformation. Strengths are in the areas of photonics for additive manufacturing, medical point-of-care devices, laser engineering services, advanced manufacturing processes and equipment for casting, metal injection and other powder metallurgy processes, sonar, UV and thermal sensor development for various industrial and health applications, as well as for underwater communications, digital twin development of industrial and production processes for the purposes of optimisation, robotics and automation implementation and data analytics using machine intelligence and AI techniques. Impact areas include metals, machinery and mining equipment, automotive, health (medical devices) and aerospace and defence.

The CSIR Future Production: Manufacturing cluster's strengths lie in its integration of advanced manufacturing technologies, including additive manufacturing, laser-enabled engineering, robotics, digital twins, and smart factory platforms, which directly support the modernisation and competitiveness of South Africa's manufacturing sector. The cluster excels in materials beneficiation, production optimisation, and the localisation of industrial capabilities, enabling rapid technology diffusion and supplier upgrading across strategic industries such as automotive, rail, aerospace, medical devices, and metals. Its operational excellence is further enhanced by real-time dashboards for project and resource management, while its Learning Factory and Smart Factory initiatives serve as catalysts for 4IR skills development, SMME inclusion, and digital transformation. These combined capabilities position the cluster to drive inclusive growth, foster innovation and build a resilient, future-ready manufacturing ecosystem.

Challenges and opportunities in the manufacturing sector

South Africa's manufacturing sector is at a crossroads, facing persistent structural challenges such as aging infrastructure, energy insecurity, and slow adoption of 4IR technologies. Key industries, including automotive, metals, rail, medical devices, aerospace, and industrial machinery, are grappling with declining productivity, global competition and skills shortages. For example, the automotive sector is pressured by the global shift to electric vehicles, regulatory demands for greener production and weak supplier capacity, while the metals industry struggles with rising imports, outdated foundries and limited innovation.

Despite these challenges, there are significant opportunities for transformation and growth. Policy reforms, targeted government incentives, and industry investments are opening new pathways, especially in areas like new energy vehicles, advanced manufacturing, and regional export markets. The rail sector is undergoing structural reforms to enable private participation and revitalise underperforming corridors, while the medical devices industry is poised for expansion, driven by local R&D and the MedTech Master Plan. Across sectors, the CSIR Future Production: Manufacturing cluster is leveraging its technological expertise in digitalisation, automation and materials science to drive localisation, sustainability, and competitiveness.

However, realising these opportunities requires overcoming internal and external constraints. The sector must address human capital gaps, modernise infrastructure and accelerate technology adoption to remain globally competitive. Strengthening supplier development, fostering innovation and building future-ready skills, especially in digital and green technologies are essential. The CSIR Future Production: Manufacturing cluster's strategic interventions for 2026–2027 focus on catalysing inclusive growth, supporting SMMEs and building a resilient, future-ready manufacturing ecosystem aligned with national policy priorities.

Manufacturing cluster long-term strategic initiatives

- **Industrial machinery and equipment:** This initiative aims to support and enhance the localisation of products within South African industry by developing internationally competitive technologies and products for local manufacture through reverse engineering, systems design engineering, multi-disciplinary design optimisation, and the implementation of a through lifecycle product development framework. The envisaged impacts include competitive products and technologies developed with industry, an increase in locally designed and manufactured products exported, and improved industry competitiveness and potential for companies to be included in global supply chains.
- **Medical devices manufacturing and health sector strategy:** This initiative focuses on unlocking a role for the CSIR in the MedTech Masterplan, building sector networking, focusing on healthcare funding streams, innovating in medical devices, supporting SMMEs in MedTech, and increasing regulatory knowledge. The envisaged impacts include improved health and quality of life, growth of the medical device sector, reduced imports/increased exports, sector sustainability, and strategic independence.
- **Rail industry development initiative:** This initiative focuses on the development and deployment of key technologies in rollingstock, infrastructure, operations, maintenance, safety, and security, while building and maintaining relationships with stakeholders in the national rail ecosystem in order to stabilise and grow the rail volumes transported by present and future rail operators.

FUTURE PRODUCTION: MINING CLUSTER

The CSIR Future Production: Mining cluster currently has two impact areas, namely Mining Testing and Training and Mining and Minerals Resources (MMR). Mining testing supports the zero-harm objective by providing quality, independent testing, and verification services to the mining industry. While the MMR impact area offers technical expertise in the areas of rock engineering, geotechnical solutions, and bespoke mining-related studies. The cluster has carved out a new developmental path that will expand its impact areas into three technology areas, namely mine digitalisation and automation (including, but not limited to, digitisation and automation of the mining value chain through design and deployment of IoT sensors, mine automation, digital integration, and application of big data analytics to enable better decision support); extraction mining process (includes but not limited to the application of advanced geophysics tools, sensors to support structural mapping of resources to improve mining, extraction of resources, improve safe conditions, e.g., remote early entry examination, preventing fall of ground); and optimised energy and decarbonisation (supporting the mining industry with its decarbonisation drive involves supporting mine electrification, improving energy efficiency and grid stability).

The cluster's strengths lie in its strategic focus on digital transformation, automation, and sustainability, supported by robust partnerships with industry leaders, research institutions, and government entities. It has developed niche capabilities in areas such as AI-driven safety platforms, competency-based virtual reality training, and advanced geotechnical sciences, enabling it to deliver innovative, value-adding solutions that address key industry challenges like safety, efficiency, and decarbonisation. The cluster's multidisciplinary team, expanded expertise, and investment in infrastructure have positioned it as a leader in mining research, development, and innovation, driving growth, modernisation, and competitiveness for South Africa's mining sector and beyond.

Challenges and opportunities in the mining sector

The South African mining industry remains a cornerstone of the national economy, employing nearly half a million people and contributing significantly to GDP and tax revenue. Recent improvements, such as the easing of electricity constraints and logistics, have set the stage for modest growth, but the sector still faces challenges including crime, regulatory hurdles, rising costs, and water provision issues. Globally, mining is affected by geopolitical tensions and commodity price volatility, while domestically, the government is focusing on critical minerals and digital transformation to enhance competitiveness and sustainability.

The industry is shaped by five major trends: capital allocation with a focus on ESG, environmental stewardship as a strategic imperative, rising geopolitical risks, resource and reserve depletion requiring advanced technologies, and the ongoing importance of maintaining a social license to operate. The energy transition is driving demand for critical minerals, pushing companies to diversify supply chains and adopt sustainable practices, while also exploring recycling and recovery to address resource depletion.

The cluster is responding to these trends by driving digital transformation, automation, and data analytics to improve safety, productivity, and cost efficiency. It is prioritising the development of local technology solutions to reduce reliance on imports, supporting skills development through 4IR platforms, and promoting circular economy principles for sustainability. Key initiatives include digital integration platforms, hydrogen dual-fuel solutions for decarbonisation, and strategic support for the critical minerals industry, positioning South Africa as a leader in mining technology and innovation.

Mining cluster long-term strategic initiatives

- The **Decarbonisation using Green Mobility in Mining Initiative** aims to develop a decarbonisation programme for the mining industry, focusing on technologies that support green mobility. This initiative is expected to contribute to the decarbonisation of the mining industry, develop high-impact decision support information, and support local SMMEs in participating in the clean energy transition.
- The **Digital Integration Platforms initiative** aims to develop significant capability in system integration and digital platforms that support the integration of systems used by various original equipment manufacturers (OEMs) and software providers in the mining industry. This initiative is expected to drive value for the mining industry by reducing the number of systems in use where information and data are duplicated, simplifying systems and digital platforms, and reducing system costs.
- The **Safety and Health Initiative** aims to develop high-impact decision-support tools to assist in decision-making for mining operators and management. This initiative is expected to improve the planning and monitoring of mining operations for process optimisation, provide operational decision support, and contribute towards the Zero Harm objective of the mining industry.

NEXTGEN ENTERPRISES AND INSTITUTIONS CLUSTER

The CSIR NextGen Enterprises and Institutions cluster aims to enable digital transformation in government, public institutions and industry. This aim is accomplished through focused initiatives in impact areas and centres. The cluster has three impact areas, namely e-Government, Networked Systems and Applications, and Operational Intelligence. Moreover, the cluster also contains the Emerging Digital Technologies for 4IR research centre and the NICIS, which is ringfenced and funded by the DSTI. Due to the cross-cutting nature of digitalisation, ICTs and 4IR technologies, the cluster plays an enabling role in a wide range of application domains in the public and private sectors. The impact areas and research centres of this cluster provide solutions in domains such as government service delivery, digital health, energy, telecommunications, education, disaster management, agriculture, mining and financial services, among others.

The cluster's strengths lie in its strong focus on delivering impactful, value-driven solutions through advanced ICT expertise and scalable digital platforms. The cluster is recognised for its ability to align its capabilities with national priorities, particularly in digital transformation, smart government services, financial inclusion, and digital economy enablement. It leverages a multidisciplinary team skilled in areas such as artificial intelligence, cloud computing, data science, and digital health, enabling it to respond effectively to both public and private sector needs. Additionally, the cluster's established track record in developing foundational technologies, supporting large-scale national initiatives, and fostering innovation positions it as a critical technology partner for government and industry, driving inclusive growth and supporting South Africa's digital transformation agenda.

Challenges and opportunities in the digital economy

The country faces mounting pressure from public and private sectors to adopt advanced digital technologies that enhance service delivery, efficiency, and competitiveness. However, South Africa's digital economy, while projected to reach 7.8% of GDP by 2025, is challenged by a history of slow industrialisation, a persistent ICT trade deficit, and heavy reliance on imported technologies from global powers. The nation's low ranking in the World Bank's GovTech Maturity Index further highlights the urgent need for improved digital maturity, especially within the public sector.

These challenges present significant opportunities for the cluster. There is scope to strengthen foundational digital capabilities, expand cyberinfrastructure, and accelerate digital transformation across government and financial sectors. The evolving financial landscape, marked by the rise of fintech, decentralised finance, and digital assets, creates a demand for robust compliance, fraud detection, and financial inclusion solutions. The CSIR is well-positioned to lead in developing digital asset transaction infrastructure, supporting regulatory compliance, and catalysing financial inclusion through innovative technologies.

Additionally, the push for digital inclusion is critical, given South Africa's high cost of mobile data, patchy connectivity, and linguistic diversity. The CSIR Next-Gen Enterprises and Institutions cluster can address these gaps by enabling affordable access to information, supporting universal connectivity, and deploying advanced technologies such as AI and cloud computing. The growing global interest in generative AI, coupled with geopolitical tensions affecting technology supply chains, underscores the need for local innovation and resilience. By leveraging its expertise, the CSIR can help South Africa transition to a more inclusive, digitally empowered society, while supporting national priorities in health, education, and economic development.

CSIR NextGen Enterprises and Institutions cluster long-term strategic responses

- One key focus is on **smart government services**, where the CSIR aims to enhance public service delivery through digital technologies. This includes developing foundational technologies for the National Health Insurance, extending the National Oceans and Coasts Information Management System across Africa, and implementing e-Participation platforms to improve public engagement in policy matters.
- In the realm of **financial inclusion and intelligence**, the CSIR is responding to South Africa's greylisting by the Financial Action Task Force (FATF) by developing technologies to enhance financial sector resilience and compliance. This includes creating platforms for real-time digital asset analytics, compliance and tax reporting software, and payment systems for digital assets. These efforts aim to promote financial inclusion, support law enforcement in detecting illicit financial activities, and improve the insurance industry's ability to price natural disaster risks. The focus is on leveraging distributed ledger technologies, AI and data science to build robust financial intelligence capabilities.

- The **smart digital services and operations** initiative seeks to bridge the digital divide and promote digital inclusion, particularly in rural areas. The CSIR plans to develop sustainable networking and cloud services, improve network coverage, and create language technologies to overcome communication barriers. Additionally, the establishment of the Empowerment Hub for South Africa (EHSA) aims to foster cross-sector collaborations and support digital transformation. These initiatives are intended to position South Africa as a leader in the digital economy, reduce ICT costs and enhance access to information and services for all citizens.

SMART PLACES CLUSTER

The CSIR Smart Places cluster aims to effect smarter resource use, optimisation of hard and soft infrastructure, and efficient and effective service developments directed towards enabling competitive socioeconomic environments, sustainable ecosystems and economic growth. The cluster has four impact areas, namely i) Inclusive Smart Settlements and Regions, ii) Functional Building Infrastructure, iii) Sustainable Ecosystems, and iv) Holistic Climate Change. The cluster also contains a hosted programme which consists of two sub-programmes that are managed on behalf of **the dtic**. Moreover, the cluster has two research centres, namely the Water Research Centre and the Energy Research Centre.

The CSIR Water Research Centre enhances water security and promotes sustainable management through real-time water quality monitoring, smart distribution technologies, and innovative wastewater treatment solutions. It advances desalination and brine beneficiation processes and develops tools like the National Water Data Repository and a smartphone app for agricultural water needs. Collaborating with government, research institutions, and industry, the Centre aims to ensure water resource availability, inform policy and drive sustainable practices.

The CSIR Energy Research Centre focuses on developing sustainable energy solutions, including renewable energy technologies, green hydrogen production, and advanced battery materials. It also works on optimising thermal systems and improving energy efficiency across various sectors. By collaborating with government, research institutions, and industry partners, the Centre aims to enhance energy security, support policy development, and promote a low-carbon economy.

The cluster excels in developing advanced tools for climate risk modelling, urban analytics, digital twins, and resource efficiency, and is a co-author of South Africa's Smart Cities Framework, giving it strong credentials in smart governance and planning. Its multidisciplinary teams enable impactful work in functional buildings, inclusive settlements, sustainable ecosystems, and climate change adaptation, while its ability to leverage existing assets and partnerships positions it as a key driver of technology-enabled urban transformation and service delivery improvement in South Africa.

Challenges and opportunities in the sector

The CSIR Smart Places cluster is shaped by several major sectoral trends that are redefining South Africa's urban and infrastructure landscape. Climate change is intensifying, with 2025 projected to be among the hottest years on record, driving demand for climate risk modelling, greenhouse gas inventories, and resilient infrastructure design. Urbanisation is accelerating, with Africa's urban population expected to double by 2050, putting pressure on South African metros and secondary cities to deliver smart infrastructure and inclusive planning. The energy sector is undergoing a transition towards renewables, with regulatory reforms and rising tariffs spurring the adoption of distributed energy resources (DERs) and the development of municipal energy markets. Water scarcity and pollution are worsening, with South Africa facing a projected 17% water shortfall by 2030 and significant non-revenue water losses, highlighting the urgent need for smart water management solutions, decentralised systems, and real-time monitoring. The circular economy is becoming mainstream globally, but local efforts remain fragmented, requiring stronger linkages between municipal systems, industrial symbiosis and green technology localisation.

These trends present opportunities and challenges for the CSIR Smart Places cluster. There is a growing need for advanced capabilities such as urban analytics, digital twins, and integrated decision-support tools to enable evidence-based planning and investment. The cluster must address gaps in real-time data integration, operationalisation of smart city governance, and engagement with informal settlements. In energy, expanding renewable R&D into DER enablement and municipal planning is critical, as is supporting local manufacturing of smart technologies. Water management requires scaling up nature-based solutions, enhancing laboratory infrastructure and developing decision-support systems for resource assessment. To remain competitive and relevant, the cluster must mainstream climate-resilient spatial planning, promote industrial efficiency, and foster open data and digital governance frameworks. Strategic alignment with national priorities, such as the Decadal Plan and ERRP, will be essential to deliver scalable, impact-driven solutions that support sustainable urban development and inclusive economic growth.

Strategic opportunities for the cluster include developing municipal decision support and digital twins for integrated planning, enhancing water loss management and revenue protection through advanced metering and analytics and supporting distributed energy resource integration with hosting-capacity studies and tariff design. Other opportunities involve scaling climate-resilient spatial planning, promoting industrial efficiency and local manufacturing and establishing robust open data and digital governance frameworks. These initiatives are designed to address urgent infrastructure needs, improve service delivery and support sustainable urban development.

Smart Places cluster long-term strategic responses

- The **Human Settlements, Utilities and Services** initiative focuses on creating sustainable and smart human settlements by integrating green infrastructure and promoting climate change adaptation and mitigation. It aims to support the building of a capable state by providing end-to-end service solutions that ensure energy and water security. The initiative also emphasises the importance of disaster mitigation and management, net-zero carbon emissions, and carbon trading. By addressing these areas, the initiative seeks to enhance the quality of life in communities and contribute to broader socioeconomic development.
- The **Industrial Revitalisation Programme** is designed to support the transition to a low-carbon, climate-resilient, and globally competitive industry. It focuses on revitalising industrial parks and economic development zones by infusing eco-industrial methodologies, such as sustainable energy, water, and waste management. The programme also promotes the JET, which aims to ensure that the shift to a low-carbon economy is fair and inclusive. By enhancing industrial competitiveness and supporting economic transformation, this initiative seeks to create jobs and drive sustainable economic growth.
- The **Ocean, Coastal and Marine Science and Ports Operations** initiative aims to lead in Southern Ocean science and technology, focusing on sustainable coastal and marine ecosystems. It addresses issues such as coastal erosion, flood risk, and pollution while promoting ecosystem restoration and sustainability. The initiative also emphasises efficient green port operations and the development of coastal industries, including energy and fuel. By integrating eco-greening technologies and bio-enhancement, the initiative seeks to create resilient coastal communities and support the blue economy. This approach not only protects the environment but also enhances socioeconomic livelihoods in coastal regions.

SMART MOBILITY CLUSTER

The CSIR Smart Mobility cluster responds to the challenges and opportunities in society and the economy associated with the mobility of goods and people, and its enabling infrastructure, systems, and operations. The cluster has two impact areas, namely Transport Systems (service-oriented), and Transport Infrastructure Engineering (technology-focused). There are new areas of specialisation under development within the cluster, including smart logistics management, transport safety, and 4IR solutions in transport and mobility. The cluster represents the confluence of various key elements including technology, mobility infrastructure, mobility systems and solutions and people to create demand-responsive, integrated, safe and cost-effective transport and mobility networks. The outcomes of the interventions will be measured in terms of increased network efficiencies, improved safety and the reduction of the generalised life-cycle cost of transport systems and infrastructure.

The CSIR Smart Mobility cluster's strengths lie in its clear strategic influence and proven ability to drive national priorities within the transport sector. It has made tangible contributions to policy and advanced the CSIR's strategic objectives through high-impact projects that showcase both technical expertise and visionary leadership. The cluster's reputation for technical acumen, combined with its capacity to deliver innovative solutions, positions it as a thought leader and key innovator in sustainable transport and mobility systems. These strengths enable the cluster to effectively shape the future of transport, support national development goals, and maintain a competitive edge in research, development, and innovation.

Challenges and opportunities in the transport and logistics sector

The external context is shaped by rapid technological, environmental, and market changes that are redefining the transport and logistics sectors. Key global trends include the rise of AI-native systems and hyperautomation, which are automating repetitive tasks, optimising decision-making, and personalising customer experiences. The integration of digital twins, IoT, and smart infrastructure is enabling real-time, adaptive management of urban systems, while edge computing is unlocking new efficiencies in logistics and transport operations.

Sustainability and ESG innovation have become central, with a strong shift towards green logistics, carbon-neutral delivery, and the development of smart cities. Investors and consumers alike are prioritising eco-conscious solutions, prompting logistics providers and infrastructure developers to optimise routes, reduce emissions, and adopt circular economy principles. Climate resilience and adaptation are also driving demand for robust, future-proof infrastructure, as governments and industries respond to the increasing impacts of climate change.

In response to these trends, the CSIR's Smart Mobility cluster is embedding AI and automation across its research and development portfolios, expanding ESG-aligned offerings, and developing edge-native platforms for real-time data processing. The cluster is also focusing on proprietary digital platforms that integrate sensor science, Geographic Information Systems, digital twins, and computer vision, while prioritising intellectual property ownership and strategic partnerships. These initiatives position the cluster to deliver sustainable, innovative solutions that address local and global mobility challenges.

Smart Mobility cluster long-term strategic responses

- One of the key initiatives is the development of **Intelligent Transport Systems and Operations**. This involves creating methods, systems, models, and technologies to promote sustainable transport. The initiative leverages core disciplines such as transport and traffic engineering, transport economics, structural engineering, ICT, data science, computer engineering and software development. The goal is to establish a safe, accessible, and efficient transport network that supports inclusive growth and job creation.
- Another significant initiative is **transport infrastructure engineering**. This initiative aims to develop engineering and technological solutions for the efficient and effective design, construction, maintenance, and management of mobility infrastructure. The focus is on operational sustainability, climate adaptation, and resilience while endorsing circular economy principles throughout the sector. The expected outcomes include improved safety and efficiency of ports and protected coastal zones, as well as smart and resilient road and rail infrastructure.
- The third major initiative is the enhancement of the **National Logistics System**. This initiative is critical for industrialisation and competitive local and international trade. It aims to achieve measurable and predictable logistics performance across industry sectors, which is essential for economic growth at both macro and micro levels. The initiative focuses on strengthening logistics ecosystems and supply chains across key industries, including agriculture and food security. The ultimate goal is to ensure sustainable water, energy, and food security while promoting low-carbon and climate-resilient economies.

NATIONAL HOSTED PROGRAMMES

Over and above the hosted programmes embedded in the clusters, the CSIR manages various national programmes on behalf of government. These are:

- **Mandela Mining Precinct (MMP)**: Focuses on modernising mining, upskilling workers, and integrating technology with people (5IR). The strategy is under review to ensure alignment with SAMERDI goals and global trends.
- **Hosted National Programmes – Special Programme Initiatives (HNP-SPI)**: Drives industrial development through technology support, localisation, and skills development. Includes Digital Advantage Initiatives, Earth Observation, Circular Innovation, and Technology Localisation.
- **Industry Support Programmes (NCPC and NFTN)**: Managed for **the dtic**, these support sustainability and competitiveness in metal casting and broader industrial sectors, focusing on resource efficiency, cleaner production, and green economy projects.
- **Aerospace Industry Support Initiative (AISI)**: Supports aerospace, defence, marine, and advanced manufacturing sectors with technology development and accreditation.
- **Hydrogen Coordination Office (HCO)**: Coordinates South Africa's Hydrogen Society Roadmap, aiming to build a competitive hydrogen economy by 2050.
- **Alliance for Collaboration on Climate and Earth Systems Science (ACCESS)**: Facilitates multi-institutional research on climate and earth systems, and trains emerging researchers.

For more details, the cluster strategic responses are also depicted in Table A7. These strategic responses speak to the three priorities of the MTDP, "A capable, Ethical and Developmental State", "Inclusive economic growth and job creation" and "Maintain and optimise the social wage".

A.2.12.2. HUMAN CAPITAL DEVELOPMENT STRATEGY

The CSIR is pivotal in advancing national strategic objectives by investing in and developing a highly skilled HC workforce. Our commitment is to cultivate expertise that drives scientific research, innovation, and technology development, which are essential for addressing the country’s socioeconomic challenges. Through these efforts, we contribute significantly to achieving national imperatives and fostering sustainable progress.

The CSIR ascribes to the call to build and strengthen SET human capabilities as outlined in the SDGs; the National Development Plan: A Vision for 2030; the Human Resource Development Strategy for South Africa 2010 – 2030; and the DSTI’s Human Capital Development Strategy for Research, Innovation and Scholarship of 2016. To optimise on the above, the CSIR participated in and contributed to the Decadal Plan objectives in November 2021. The CSIR strategy for 2026/27 – 2030/31 considers this context and is aligned with the national policy on STI.

The CSIR has adopted five strategic pillars to achieve the CSIR SO4: Build and Transform Human Capital and Infrastructure. The five strategic pillars aim to align HC strategy and operational planning with the CSIR’s new strategy, vision, mission and values and to create synergy with HC functions and strategic leadership roles to achieve and implement cultural change initiatives. The diagram below shows the alignment between the five strategic pillars and the CSIR’s mandate, mission, vision and values.

Figure A12: CSIR’s Capital Development Strategy



Building a diverse talent ecosystem and a sustainable future supply of limited skills

Building a diverse talent ecosystem is crucial for equipping the CSIR with highly skilled human capital, which is essential for driving organisational growth and ensuring long-term sustainability. This strategic approach will not only support the achievement of our strategic objectives and mandate but also elevate the CSIR’s role and contributions towards advancing socioeconomic development and technological progress in the country and for its people.

The objective is to expand the CSIR’s talent ecosystem and ensure a sustainable supply of human resources that aligns with capacity and skills demands to meet the business objectives of the organisation. Key focus areas to achieve this goal include targeted talent acquisition and management, strategic workforce planning, pipeline development, organisational learning, Corporate Social Investment, an Alumni Programme and the enhancement of external partnerships.

Strengthening leadership and deepening professionalism

Our strategy to cultivate a motivated, high-performing, and diverse workforce is comprehensive and strategically focused. Central to this approach is a robust emphasis on leadership development and long-term career growth for our employees. We are committed to enhancing leadership and management capabilities through our Leadership and Management Development Programme (LMDP), designed to nurture current leaders and high-potential talent.

To advance professionalism and align staff behaviours with our EPIC values, the CSIR is implementing targeted development initiatives and forging partnerships with industry experts. These programmes are aimed at strengthening key behavioural competencies, facilitating skill transfer, and driving continuous professional growth. This multi-faceted strategy ensures we build a dynamic workforce equipped to excel in today's competitive environment.

Improving individual and organisational performance

Our objective is to elevate both individual and organisational performance by systematically pursuing excellence and fostering a high-performance and people-centric culture. This will involve a staged approach to address key areas for improvement and enhance our capabilities.

To achieve this, we will implement critical HC initiatives designed to boost operational efficiency and organisational performance. Key initiatives include embedding a compelling Employee Value Proposition to attract and retain top talent, enhancing performance management systems, increasing employee engagement, and performance-based reward practices. These efforts are essential for driving sustained excellence and achieving our strategic goals.

Increased efficiency and effectiveness of HC systems and processes

The CSIR is dedicated to maximising efficiency and effectiveness by optimising its systems to boost productivity and enhance client impact. To support this, HC systems and processes remain a strategic priority, essential for achieving our organisational objectives and initiatives. Key to our success is the standardisation and automation of processes, coupled with increased utilisation of current systems. These improvements are crucial for elevating service delivery and driving greater effectiveness and efficiency within our HC functions.

Advancing women, youth and people with disability

Engagement activities are central to the CSIR's mission, with several key initiatives, including the Women's Forum and the Youth Forum, designed to drive impactful change. The Women's Forum plays a crucial role in empowering women, particularly in traditionally male-dominated fields. It focuses on providing solutions with women at the forefront, championing their development and leadership. In addition, the advancement of women is prioritised through recruitment planning aligned with the CSIR Employment Equity Plan (EEP).

Youth Forum initiatives further emphasise the role the youth play in contributing to and influencing the strategic future of the CSIR. The forum creates space for networking and collaboration among young professionals while also contributing to the development of a vibrant and inclusive organisational culture within the CSIR. The advancement of people with disabilities is also a key focus for the CSIR. The organisation currently employs 2.7% of people with disabilities, which is 1.7% above the minimum target of 2% as determined by the Department of Employment and Labour.

A.2.12.3. RESEARCH INFRASTRUCTURE INVESTMENTS

Research infrastructure is a key component in achieving the strategic objectives of the CSIR. Therefore, there is a need to renew the CSIR's infrastructure to support the achievement of its strategic objectives.

Figure A13: Infrastructure and facilities investment framework



The investments in infrastructure aim to create a robust and sustainable environment that supports the CSIR's strategic goals. By ensuring compliance, enhancing safety, maintaining business continuity, and optimising resources, these investments are essential in providing a foundation for advancing research and development activities. This holistic approach not only safeguards current projects but also positions the CSIR for future growth and innovation.

The current portfolio of infrastructure investments include:

- Self-funded Capital infrastructure investment (R151 million); and
- National Treasury-funded projects (R230 million).

The planned investment falls short of the billion Rand investment required to address critical infrastructure requirements. The planned portfolio of investments seeks to align with the CSIR's strategic goals, ensuring that the limited resources are used effectively to support growth, relevance, impact, and sustainability, given the severe shortage of infrastructure investment. The support for R&D means that upgraded and well-maintained infrastructure provides a conducive environment for cutting-edge research and innovation, enhancing the CSIR's ability to contribute to technological advancements and achieve its mandate.

In support of these aspirations, effective governance and risk management practices are in place to ensure that infrastructure investments are financially viable and strategically aligned, minimising risks associated with significant capital expenditures.

Self-funded capital infrastructure investment

Over the 2024-2025 financial cycle, the CSIR has invested approximately R78 million in capital infrastructure from its own reserves. The key areas of investment seek to enable and address priorities of health and safety, business continuity, revenue generation, ICT, and sustainability. Through a planning mechanism that identifies capital improvements and investment in each financial year, the CSIR consolidates the organisation's infrastructure priorities, and its financial resources to enable the CSIR to make decisions in the short-term.

Going forward the CSIR has developed a 10-year plan to guide the CSIR in its investment approach to address future facility and infrastructure requirements. The plan outlines a proposed facilities and estate investment programme to support the CSIR's strategic plan and optimise spending within the available funding. The initial assessment of the implementation of the 10-year plan indicates an investment requirement of R1.4 billion.

These requirements will be prioritised against:

- Infrastructure for projected growth;
- Maintenance of competitive market position;
- Maintenance of current operations and staff safety; and
- Refurbishment and adaptive reuse of buildings.

These proposed investments are envisaged to have the following outcomes:

Figure A14: Infrastructure and facilities investment outcomes



This plan is a living document, guiding CSIR's infrastructure investments to support its strategic vision, ensuring flexibility to adapt to emerging needs and priorities over the next decade.

National Treasury-funded projects

The NT, through the DSTI, approved funding for the establishment of strategic research infrastructure at the CSIR, for upgrades and or enhancement of capability to existing infrastructure. Phase one, with a value of R 185 million, included (a) an open innovation laboratory to support active pharmaceutical ingredient manufacturing, (b) the learning factory, (c) the road materials testing laboratory and (d) the port model hall. A second phase of the programme, starting in October 2025 over a three-year period, with a value of R230 million, aims to establish comprehensive research infrastructure capabilities designed to support high-impact research projects in the areas of aerospace, food security, public health, mining, water sustainability and transport and safety.

A.2.12.4. CAPABILITY DEVELOPMENT

As part of implementing the CSIR strategy since 2019/20, strategic and centrally funded initiatives were implemented to support the CSIR's intent of growth and sustainability and to ensure the relevance of CSIR RD&I through the involvement of industry, state-owned enterprises, government, and other innovation partners in the NSI.

Since its inception in 2019/20, the CSIR has invested R188 million, with an additional R3.5 million leveraged from the DSTI, in 13 initiatives. These include Smart Logistics Management capability, funding of a Smart Mobility Research Chair, PharmaTech Innovation Platform, Bioconversions Platform, Precision Agriculture Spatial Information Systems, Aquaculture Diagnostics Program, Digital Modelling of TMM for collision prevention, application and integration of geophysical tools (uav-gpr project), enhanced mine worker safety training, digital automation and decarbonisation systems, the H2 Decision Support tool, precision medicine/DigiBiobank and the circular economy.

These initiatives are collaboration initiatives that improve the competitiveness of high-impact industries to support South Africa's re-industrialisation. The investment has been strategically deployed to these critical projects as they have shown the highest potential to derive maximum impact in line with the CSIR's strategic intent.

The funding period and related funding commitments for these centrally funded initiatives were concluded in March 2026/27. Due to funding constraints, no new centrally funded investments were made following the conclusion of those commitments. Future investments will be dependent on the availability of funding and will be made at the discretion of Exco.

To enable CSIR to maintain these initiatives, securing government funding through a Parliamentary Grant ensures continuous support for CSIR's research projects. The current allocation of the CSIR's PG poses a risk to the capacity of the organisation to maintain these strategic investments. Over the 2025 MTEF, the CSIR will not be able to invest in new capabilities or maintain existing ones. This poses a major risk to the strategic thrust of the organisation. There is a drive for private sector investments wherein collaborations with private sector companies provide additional funding and resources, enhancing CSIR's research capabilities.

RESEARCH CENTRES

In addition to these critical projects, the CSIR has continued to invest in research centres in the areas of synthetic biology, cybersecurity, robotics and future production, water research, emerging digital technologies for the 4IR, nanomaterials and advanced materials. These research centre investments aim to enhance research and technology in specific areas consolidated and further developed into deep world-class capability to support multiple areas of application across the organisation. The CSIR has invested R270 million since 2019/20 in the following areas:

The Emerging Digital Technologies for the Fourth Industrial Revolution Research Centre focuses on four advanced technology themes (i) Advanced IoT – which involves developing full IoT solutions from edge devices to cloud systems to enhance security (ii) AI – which uses AI methodologies for data prediction and classification to improve decision-making; (iii) Extended Reality – which creates competitive advantages through 3D modelling to accelerate human-computer interaction; and (iv) Distributed Ledger Technology – which develops decentralised applications to increase efficiency, reduce transaction costs, and enhance security verification. The research centre's competitive edge lies in de-risking 4IR investments for South African organisations by conducting valuable research and creating technology building blocks for adoption by government and industry.

The Information and Cybersecurity Research Centre focuses on three main areas: (i) research and innovation, capacity building, and (ii) support services. It aims to develop solutions for identity management and cybersecurity, addressing vulnerabilities and threats to protect physical and digital systems. The research centre also emphasises building advanced capabilities for managing risks and threats, particularly for institutions and individuals. Additionally, it provides support services for national enforcement and data protection.

The Water Research Centre focuses on three main areas: smart water use, smart water infrastructure, and smart water analytics and services. In smart water use, the centre provides specialised water quality analysis, addressing issues like ecotoxicity, emerging pollutants, and nature-based treatment alternatives. Smart water infrastructure emphasises continuous

improvement and support, including training on wastewater treatment products and alternative energy solutions for treatment plants. Lastly, smart water analytics and services involve groundwater resource assessment, surface water monitoring, and hydrological modelling, with a focus on agricultural water use efficiency. This comprehensive approach aims to manage water resources efficiently through innovative methods of usage, infrastructure and analytics.

The Water Research Centre faced significant financial challenges, reporting substantial losses that impacted the overall financial health of the Smart Places cluster. Additionally, the centre struggled with maintaining and upgrading water infrastructure to ensure availability and affordability. Developing and implementing new water management technologies required substantial investment and collaboration, adding to the financial strain. Engaging with a wide range of stakeholders, including government departments and industry partners, was essential but challenging, requiring effective collaboration and strategic partnerships. Despite these hurdles, the centre made notable contributions to water management practices and technological innovations.

The Centre for Robotics and Future Production focuses on four key areas (i) AI and robotics (ii) machine vision (iii) future production systems, and (iv) manufacturing execution systems. In AI and robotics, the centre emphasises 3D mapping, situational awareness using LIDAR and automation, along with assessments related to the 4IR. Machine vision is dedicated to quality control, anomaly detection and post-estimation techniques. Future production systems explore machine intelligence and the application of large language models (LLM). Manufacturing execution systems concentrate on monitoring manufacturing processes from raw materials to finished products. Overall, the research centre aims to develop innovative products and systems by conducting needs analysis and staying updated with industry advancements.

The Centre for Nanostructure and Advanced Materials focuses on three primary research areas: (i) Advanced functional materials (ii) polymer nanocomposites, and (iii) characterisation and Imaging. In the realm of Advanced Functional Materials, the centre explores biodegradable polymers and materials for pharmaceuticals, packaging, and biomedical applications, aiming to support industrialisation and create eco-friendly alternatives. The polymer nanocomposites section is dedicated to enhancing the properties of bulk materials, such as thermal resistance and fire retardancy, with applications in automotive, aerospace, and other sectors. Lastly, the characterisation and imaging area employs a wide range of advanced instrumentation techniques, including high-resolution transmission electron microscopy, atomic force microscopy (AFM), and various spectroscopy methods, to analyse and understand nanomaterials. The centre's competitive edge lies in its advanced research capabilities, innovative approach to materials science, and commitment to sustainability.

The Synthetic Biology Research Centre focuses on (i) Bioengineering and genomics for the African microbiome research to understand its impact on precision medicine, digital precision medicine, genome engineering, and stem cell bioengineering to improve treatment outcomes. The synthetic nanobiotechnology capability highlights the development of synthetic biological systems for industrial applications and novel metabolic biosystems through systems biology. The precision medicine expertise emphasises cancer precision medicine, including drug sensitivity screening platforms using synthetic biology, and innovations in synthetic biology for viral hepatitis prevention. Additionally, the centre is noted for being the first in the country to establish NRF Research in innovative synthetic biology, positioning itself at the forefront of translational research with hospitals on bioengineered livers and drug sensitivity tests. With the collaboration and support from the DSTI, the centre is revising the National Biodesign Framework, which is pivotal to the renewal of the center's strategy.

The Energy Research Centre focuses on four main areas: (i) Energy supply and demand, (ii) electro-chemical technologies, (iii) energy systems, and (iv) energy industry. In energy supply and demand, the centre provides specialised research in energy efficiency and demand shaping, renewable energy technologies, and hydrogen techno-economics. Electro-chemical energy technologies emphasises technology development of lithium-ion batteries focusing on anode and cathode active material, fuel cells to support the hydrogen economy and super capacitors. Energy systems focuses on a systems approach to long term energy planning, grid planning, microgrids and energy system design and operation. Lastly, energy industry is an end-user focused research group which supports industrialisation through socioeconomic assessment, techno-economic analysis and provide SMME development in the pursuit to support the JET. The Energy Centre provides fact-based expertise and essential research infrastructure necessary to address South Africa's growing energy needs, and the associated industrialisation opportunities for new products and services. The Centre's growth and impact plan responds directly to the challenges identified in the National Development Plan (NDP) by providing unbiased decision support to solve long-term sustainable energy needs of South Africa, while concurrently addressing issues such as carbon dioxide emissions, water use, uncertainty, localisation and regional development.

The Photonics Centre focuses on five main areas: laser enabled manufacturing, novel laser system development, laser engineering services, biophotonics and national programmes that support photonics and additive manufacturing technology development nationally. The centre develops novel photonics and laser technologies, processes, products and services that serves a wide range of industries. High power laser processing of metals with custom built machinery is one of the core offerings of the centre. Teams develop laser cladding, additive manufacturing and laser shock processing systems and then conduct extensive application focussed R&D to apply them for end users in advanced industries such as energy generation, petrochemical refining, mining equipment and aerospace part manufacturing. Core research focuses on innovation in machine development, motion control, laser and laser beam delivery systems, process monitoring, and novel metal alloys all driven by end-user requirements. The research outputs are implemented by teams that offer high power laser processing services to clients, the majority of which are entities such as Eskom and Sasol. Teams also develops novel photonic biosensors to detect a range of diseases such as HIV and tuberculosis in a cost-effective manner at the PoC, as well as other advanced medical equipment and medical device manufacturing processes. The centre also hosts a range of photonic and manufacturing programmes to support research and education at higher learning institutions across South Africa and the wider African continent.

A.2.12.5. ENABLING SUPPORT FUNCTIONS

Just like any large organisation, the CSIR has several support functions that are key to the delivery of the organisational strategy through central coordination of various activities such as RD&I management, intellectual property management, ICT support, legal support, financial management support, supply chain management, human capital management, corporate communications, and so forth. With the increasing compliance requirements associated with the entity as well as the complex operations of a large multi-disciplinary organisation, a well-capacitated support portfolio is critical to enable the operations of the CSIR. The ongoing reduction of PG reduces the organisation's ability to cover the costs associated with a fit-for-purpose support function, including its capacity as well as the ICT systems required to enable much-needed automation to increase efficiencies.

FINANCE, ICT AND SUPPLY CHAIN MANAGEMENT

The Financial Services portfolio's strategic objectives are to provide strategic financial leadership through sound advice, direction, and performance monitoring; ensure effective financial management and reporting to support financial growth and sustainability; facilitate financial sustainability by managing resources to secure the CSIR's long-term viability; uphold governance and compliance by maintaining robust management processes and legislative adherence; and drive operational efficiency and resource management through innovation, integration, and automation. All these objectives are underpinned by a commitment to digital transformation, ensuring that financial systems and processes are continuously improved to support the organisation's critical functions effectively.

The Supply Chain Management portfolio's strategic objectives are to leverage procurement spend to support growth, localisation, and transformation; drive a high-performance culture that eliminates delays and bureaucracy to improve agility and responsiveness; apply focused strategic sourcing methods to reduce procurement delivery lead-times and increase cost savings; automate labour-intensive and non-value-adding aspects of the procurement process for more effective use of personnel; and improve performance monitoring and management systems for contracts, suppliers, and employees. These objectives are underpinned by a commitment to comprehensive preferential procurement, enterprise and supplier development, robust B-BBEE improvement, and continuous training and development to ensure compliance, efficiency, and value creation across the supply chain.

The ICT Services portfolio's strategic objectives are to consolidate current products and tools to streamline operations, centrally coordinate ICT activities for improved oversight and efficiency, implement an integrated and automated back office to enhance business processes, establish a seamless and collaborative environment internally and externally to support CSIR's business functions, and build the capability to drive digital transformation across the organisation. These objectives collectively aim to ensure IT service availability, stability, and security, while enabling innovation, operational excellence, and alignment with CSIR's strategic goals.

THE HUMAN CAPITAL

The Human Capital portfolio's strategic objectives are focused on building and transforming a diverse talent ecosystem to ensure a sustainable future supply of skilled staff, strengthening leadership and professionalism, improving individual and organisational performance, increasing the efficiency and effectiveness of human capital systems and processes, advancing women, youth, and people with disabilities, and supporting transformation and retention of critical and scarce skills. These objectives are achieved through targeted recruitment, succession planning, career development, strategic partnerships, learning and development programmes, employee wellness initiatives, and robust policies and systems that align with the CSIR's mandate and strategic goals.

STRATEGIC COMMUNICATION

The Strategic Communication portfolio's objectives are to raise the visibility of the CSIR, communicate its impact, and build brand reputation through targeted media engagement and digital campaigns; contribute to attracting RD&I business and commercialisation opportunities in public and private sectors by facilitating participation in key events and implementing strategic marketing initiatives; promote the CSIR as an employer of choice via Employee Value Proposition campaigns

and recognition programmes; foster informed and engaged employees through internal communication platforms and engagement sessions; and spearhead science engagement by delivering outreach programmes, webinars, and profiling researchers to inspire interest in STEM and showcase the CSIR's innovation capacity.

LEGAL, COMPLIANCE AND BUSINESS ENABLEMENT

The Legal and Compliance Services portfolio's strategic objectives are to support the CSIR's mandate by providing comprehensive legal and compliance services, supporting commercialisation and intellectual property management, maintaining high standards of ethical conduct, ensuring regulatory compliance, managing risks, and continuously improving internal processes and stakeholder engagement to advance the organisation's strategic goals.

The Facilities Management and Security Services portfolio's strategic objectives are to ensure that the CSIR has fit-for-purpose facilities, infrastructure, and associated services that support its core business and attract key tenants; to protect people, physical assets, and property through robust security strategies and compliance with relevant legislation; to deliver efficient and responsive support services through effective contractor management and service level agreements; and to maintain full compliance with all applicable policies, procedures, and standards in the FM&SS area of responsibility, while driving sustainability initiatives and continuous improvement across all operations.

The Enterprise Risk Management Services portfolio's strategic objectives focus on proactively identifying, assessing, and mitigating risks, enhance visibility and support for business partners, and drive continuous improvement in risk management practices to achieve strategic and operational excellence. The enterprise risk management operating model supports good governance, compliance, and achievement of organisational goals. This includes embedding a risk-aware culture through specialist advisory services, implementing robust risk management policies and frameworks, and ensuring continuous improvement via training, awareness, and automation.

The SHEQ portfolio's strategic objectives focus on reducing recordable incidents through robust risk assessments and behaviour-based safety programmes, enhancing employee health and wellbeing via medical surveillance and occupational hygiene, promoting responsible use and conservation of natural resources through water, waste, and biodiversity management, and driving continual improvement in SHEQ leadership, communication, and training. The objectives also include maintaining compliance with international standards (ISO 9001, ISO 14001, ISO 45001), strengthening contractor and supplier SHE management, standardising document and records management, implementing carbon and energy management systems, and ensuring responsive service delivery aligned with operational needs, all underpinned by rigorous risk management and governance practices to support the CSIR's mandate and strategic goals.

The Conferencing and Accommodation portfolio's strategic objectives include partnering with developers to provide onsite accommodation and co-workspaces for conference delegates, expanding the Science Diplomacy Capital hub in collaboration with the DSTI, and building relationships with CSIR professionals to attract national and international conferences.

BUSINESS EXCELLENCE AND INTEGRATION

The Business Excellence and Integration portfolio's strategic objectives are to drive organisational excellence by facilitating strategic partnerships, enhancing parliamentary relations, and ensuring robust RD&I management, oversight, and governance. The portfolio aims to support learning and growth, uphold research integrity, and manage technology demonstrators and IP and technology transfer processes efficiently. It also focuses on improving agility and operational efficiency, delivering high-quality information and records management services, and supporting institutional planning, monitoring, mandatory reporting and evaluation to enable the successful implementation of the CSIR's strategy and the achievement of its strategic intent.

A.2.12.6. DRIVERS OF SUCCESSFUL STRATEGY IMPLEMENTATION

The drivers of CSIR Strategy implementation essentially encompass elements that speak to financial and income diversification strategy.

BUSINESS DEVELOPMENT AND COMMERCIALISATION

The evolution of the Business Development and Commercialisation function

The BD&C function, having three divisional offices, serves as a vital bridge between R&D and the marketplace. Its role, driven by the organisation's strategic objectives, is specifically aimed at translating research into tangible socioeconomic outcomes. It is thus responsible for several functions including growing contract R&D income and diversifying revenue streams, driving the commercialisation of specific technologies, securing funding and strategic partnerships for market entry and supporting clusters to ensure their R&D strategies are market-aligned.

Formally initiated in 2020/21, the BD&C function is still in its nascent stages, straddling the "norming and performing" phases of its development. While facing challenges such as capacity constraints and the need for deeper integration of specialised skills within clusters, the function has already demonstrated achievements. These include enhanced negotiation of complex, large-scale contracts, increased cluster awareness of and engagement with industry needs and expansion of international funding streams and/or market reach.

Given the CSIR's wide range of technologies and the idiosyncrasies of the clusters, each BD&C office adopts a bespoke approach. For some clusters, the BD&C focus has been on partnerships to de-risk IP development and ensure market readiness. For others, it has been about supply-side interventions to stimulate further development and partnerships, maturing technologies, and developing new market-relevant innovations. These strategies will continue to change in response to the dynamic landscape of the CSIR.

Overall, despite its infancy, the BD&C function is actively progressing and some of its achievements demonstrate a promising trajectory.

CSIR's public sector engagement

The CSIR's public sector engagements will be enhanced through strategic partnerships, policy advocacy, and a focus on unique capabilities. The CSIR will increase exposure of government departmental officials to the CSIR's offerings for government, in order to forge long-term strategic contracting similar to the DERI model in support of the Department of Defence, where the CSIR acts as a strategic partner with long-term investment in strategic capabilities to address national security needs.

CSIR's private sector engagement

The CSIR's engagement with the private sector is driven by the need to diversify its income streams and reduce reliance on public sector funding. With the South African private sector investing over R15 billion annually in R&D, the organisation recognises that opportunity in expanding its footprint in private sector partnerships.

To address this, the CSIR has developed several models for engaging with private industry. These include driving joint technology development agreements, where the CSIR and a private partner co-invest in new technology aligned with both parties' strategic objectives. The organisation also drives contract research arrangements, in which the CSIR provides technical solutions to specific industry problems on a fee-for-service basis. The CSIR also licences its innovations to partners for commercialisation.

Beyond these, the CSIR pursues joint business and market development initiatives, collaborating with companies that have complementary capabilities to jointly pursue market opportunities. Public-private collaborations are also common, especially in projects where the CSIR and private partners co-develop solutions for public sector clients, sharing expertise rather than exchanging funds. Subcontracting and SMME support are other avenues, with the CSIR involving SMMEs in larger projects and running government-funded programmes to build SMME capabilities.

SMME support: strategic approach and insights

The CSIR's approach to supporting SMMEs is multifaceted (see table A1), focusing on leveraging its technological expertise, infrastructure, and partnerships to enable small businesses to participate in high-value sectors. The organisation does not act as a general small business support agency; rather, its interventions are targeted where technology and innovation can make a significant impact to the SMME. Over the past five years, the CSIR has supported more than 770 SMMEs, primarily through externally funded programmes in areas such as biotechnology, photonics, biorefinery, aerospace, and technology localisation. These programmes are typically sponsored by government departments or industry partners, as the CSIR's own resources are insufficient to sustain broad-based SMME support.

A key principle guiding the CSIR's SMME support is mandate alignment. The organisation's interventions are consistent with its core mission of advancing technology and industrial development.

By providing access to advanced facilities for product development, prototyping, testing, and small-scale manufacturing, developing digital platforms, and regulatory support, the CSIR can lower barriers to entry for SMMEs, providing access to data, technology, and networks that would otherwise be out of reach. For example, the precision agriculture platform allows small farmers to access advanced analytics and market information, while biotech incubation programmes provide startups with access to state-of-the-art laboratories and technical expertise. These platforms are designed to be scalable, enabling hundreds or thousands of SMMEs to benefit from a single investment, providing access to advanced infrastructure and equipment.

Table A1: CSIR SMME support modalities

Modality	Description and example	Funding source	Impact focus
Subcontracting	SMMEs integrated into large projects (e.g., defence sector)	Project/government	Value chain inclusion
Direct support programmes	Sector-specific, externally funded SMME support	Government/partners	Capacity building
Platform enablement	Digital platforms (e.g., agriculture, security)	Government/industry	Scalable access
Skills development and exchange	Training, infrastructure, technical validation	Mixed	Capability uplift
IP & commercialisation	Licensing, technology transfer	Mixed	Market access

Divisional private sector plans

The CSIR's plan for the **health and pharmaceuticals sector** engagement is a comprehensive, multi-layered approach designed to transform South Africa's health innovation landscape. At its core, the plan aims to reduce the country's reliance on imported medicines, diagnostics, and vaccines by building robust local manufacturing and research capabilities. This focus on health sovereignty is intended to ensure that South Africa can respond rapidly and effectively to public health needs, while also stimulating the growth of a competitive local pharmaceutical and biotechnology industry.

A foundational element of the plan is the development of **translational infrastructure**. The CSIR is investing in pilot-scale manufacturing facilities and advanced laboratories capable of producing clinical-grade materials. These facilities are crucial for bridging the gap between early-stage research and commercial production, enabling South African innovations, such as diagnostics, vaccines, and therapeutics, to progress from laboratory discovery to market-ready products. By providing clean rooms, regulatory support, and technical expertise, the CSIR lowers barriers for emerging local companies, especially SMMEs, helping them to enter high-value manufacturing and bring new products to market.

Strategic partnerships are another cornerstone of the plan. The CSIR actively collaborates with original equipment manufacturers (OEMs), multinational corporations, and international foundations to bring advanced technologies, funding, and training opportunities to South Africa. These partnerships position the CSIR as a hub for health innovation on the continent and accelerate the commercialisation of local products. The CSIR also works closely with universities, science councils, and industry consortia to attract catalytic funding from global sources such as the Gates Foundation and the European Union.

Policy advocacy is a key enabler for the plan's success. The CSIR engages with government to influence procurement policies that guarantee market share for local manufacturers and advocates for regulatory reforms such as requiring imported

drugs to be tested on African genetic models to improve safety and efficacy. The plan also calls for incentives and enabling legislation to support local industry growth and innovation, recognising that policy coherence across health, industry, and procurement is essential for sustainable impact.

To maximise reach and impact, the CSIR focuses on scalable, **horizontal platforms**. These include digital health platforms and manufacturing hubs that can serve multiple companies and communities, as well as rapid response platforms for health emergencies. Such interventions are designed to be scalable and to benefit a wide range of stakeholders, improving public health outcomes and system resilience.

Workforce development is also prioritised, with the CSIR offering training and upskilling programmes for the health manufacturing sector. This ensures a pipeline of qualified professionals and supports job creation, while facilitating workforce exchanges and upskilling through partnerships with global leaders.

Table A2: Elements of the CSIR health and pharmaceuticals sector plan

Focus Area	Key activities and offerings	Intended impact/outcome
Translational infrastructure	Pilot-scale manufacturing, clinical laboratories and regulatory support	Bridge research to market and enable SMMEs
Strategic partnerships	OEMs, multinationals, funders, universities and consortia	Leverage funding, tech, skills and market
Policy advocacy	Procurement reform, regulatory change and incentives	Market access and local industry growth
Scalable platforms	Digital health, manufacturing hubs and rapid diagnostics	Broad access and system resilience
Workforce development	Training, upskilling and workforce exchanges	Skilled workforce and job creation

The CSIR’s plan for the **energy sector** engagement is a comprehensive approach aimed at supporting South Africa’s transition to a secure, sustainable, and inclusive energy system. The plan is built around the dual imperatives of energy security and decarbonisation, recognising the urgent need to address load shedding, rising energy costs, and the global shift towards renewable energy. The CSIR’s work spans the entire energy value chain, from generation and transmission to demand-side management (see table A3), with a strong focus on enabling the growth of renewables and supporting a just energy transition.

A central pillar of the plan is the provision of **technical, economic, and policy analysis to inform energy planning and decision-making** for both public and private sector stakeholders. The CSIR leverages its expertise in energy demand and supply analytics, renewable energy forecasting, and techno-economic analysis to guide investments and policy reforms. This includes supporting the integration of renewable energy sources such as solar and wind, conducting resource assessments, feasibility studies, and system integration work to ensure grid stability and the effective deployment of microgrid solutions, particularly in remote or underserved communities.

The CSIR also plays a key role in advancing **technology development and quality assurance within the energy sector**. This involves research and development in advanced materials for solar and wind technologies, battery storage, and hydrogen, as well as providing testing and quality assurance services for both imported and locally produced energy technologies. Facilities such as solar PV and battery testing laboratories ensure that South Africa’s energy infrastructure is reliable, efficient, and suited to local conditions.

Another important focus area is **supporting the JET**, particularly in coal-dependent regions like Mpumalanga. The CSIR works with municipalities and industry to model energy mixes, develop transition plans, and design decentralised energy solutions that can support local economies and communities. This includes helping to identify and address the skills needed for the emerging hydrogen economy and broader energy sector, in collaboration with government and industry partners.

The plan also recognises the increasing role of the private sector in energy generation, especially as policy reforms have enabled private procurement and trading of renewable energy. The CSIR aims to position itself as a strategic partner for both government and industry, **offering technical expertise, infrastructure, and advisory services to unlock investment, support localisation**, and ensure that the benefits of the energy transition are widely shared.

Economic impact is a key consideration, with the annual market for energy generation estimated at R26–50 billion and transmission and distribution at R30–40 billion. The CSIR targets a share of these markets through its specialised capabilities, focusing on high-impact areas such as resource assessment, grid modeling, and demand-side management. The organisation also seeks to unlock green financing and influence the direction of investment, particularly in battery technology and hydrogen, leveraging South Africa’s mineral endowment.

The CSIR’s energy plan is underpinned by a commitment to partnership, scalability, and impact. By focusing on solutions that can benefit multiple stakeholders and sectors, and by measuring success in terms of economic, social, and environmental outcomes, the CSIR seeks to play a leading role in shaping South Africa’s energy future.

Table A3: Elements of the CSIR Energy Sector Plan

Area	Key activities and offerings	Target market/impact
Energy generation	Resource assessment, feasibility and PV/wind/battery testing	R20–40 million/year
Transmission and distribution	Grid modeling, stability, microgrids and master planning	R30–40 million/year
Demand side	Energy mix modeling, cost reduction and carbon tax mitigation	Industrial and municipal clients
RD&I	Solar, wind, hydrogen, storage and advanced materials	National and international partners
Skills development	Training and capacity building for hydrogen economy	Workforce, government and industry

The CSIR’s plan for the **Logistics sector** engagement is designed to address South Africa’s pressing need for a more efficient, integrated, and competitive logistics sector; one that underpins economic growth, trade, and industrialisation. The plan recognises the sector’s current challenges, including fragmentation, inefficiency, and a lack of reliable, independent information. To tackle these, the CSIR is leveraging its research, technology, and convening power to create data-driven platforms, support small and emerging players, and foster partnerships across the logistics value chain.

A cornerstone of the plan is the development of **integrated data platforms and observatories**. The CSIR has established a Logistics Observatory that provides a single, layered view of the logistics sector, ranging from regulatory and policy frameworks to real-time operational data. This observatory is structured to serve multiple user groups: at the top, it supports regulatory and policy analysis; in the middle, it enables strategic infrastructure and vulnerability assessments; and at the operational level, it provides real-time information for logistics operators, such as current backlogs at ports or along corridors. This approach empowers decision-makers in government, industry, and logistics operations to identify bottlenecks, optimise infrastructure investments, and improve corridor performance, supporting both high-level strategic planning and day-to-day operational decisions.

Another key component is the use of **simulation and modeling tools**. The CSIR develops logistics simulation models that allow stakeholders to test scenarios, assess the impact of interventions, and make evidence-based decisions. For example, corridor modeling helps identify the most effective ways to unblock freight corridors, optimise travel times, and allocate resources for maximum impact. These tools are used to analyse and improve the performance of key logistics corridors, such as the Maputo Corridor, by simulating different interventions (e.g., increasing staff, changing shift patterns, or investing in infrastructure) and measuring their impact on throughput and efficiency.

The plan also emphasises **platform-based solutions** to support SMMEs and small-scale players in the logistics value chain. The CSIR’s *ilima* platform, for instance, enables small-scale farmers to access markets by providing traceability, quality assurance, and integration with retailers and consumers. This digital platform connects farmers, suppliers, retailers, and consumers, ensuring that products meet quality standards and can be traced from farm to fork. By lowering barriers to market entry and providing digital tools for compliance and quality, the CSIR helps level the playing field for SMMEs and supports inclusive economic participation.

To promote **self-regulation and accountability**, the CSIR has developed tools like the Logistics Accountability Score. This tool allows logistics providers to benchmark their compliance and performance across key metrics such as loading,

customs clearance, and driver behavior. By making these scores visible, the CSIR encourages competition, transparency, and continuous improvement within the sector, enabling customers to choose providers based on performance and compliance.

The logistics plan is also responsive to broader trends such as the growth of e-commerce, the AfCTA, and the increasing importance of technology and automation. The CSIR works closely with government departments, industry associations, and international partners to drive innovation and address sector fragmentation. The plan recognises the need for integration across different transport modes (road, rail, sea, air) and sectors (agriculture, mining, automotive, chemicals), and aims to provide independent, reliable information to all stakeholders. The CSIR also supports policy development and infrastructure optimisation, positioning South Africa as a potential regional logistics hub.

Table A4: Elements of the CSIR Logistics Sector Plan

Focus area	Key activities and offerings	Intended impact/outcome
Data platforms and observatories	Integrated logistics observatory and real-time data layers	Informed decision-making and transparency
Simulation and modeling	Corridor modeling, scenario analysis and optimisation tools	Infrastructure efficiency and bottleneck resolution
Platform solutions	eLima platform for SMMEs, traceability and market access	Inclusive growth and SMME empowerment
Self-regulation and accountability	Logistics Accountability Score and benchmarking tools	Improved compliance and sector performance
Policy and partnerships	Support for policy, integration across modes and sectors, collaboration	Regional competitiveness and innovation

The CSIR’s plan for the **manufacturing sector** engagement is a strategic framework aimed at revitalising and modernising South Africa’s manufacturing sector through science, engineering, and technology. The plan is rooted in the recognition that manufacturing remains a cornerstone of economic growth, job creation, and industrial resilience, even as the sector faces challenges such as global competition, deindustrialisation, and rapid technological change.

A central pillar of the plan is **business development and industry engagement**. The CSIR invests in building strong relationships with both large manufacturers and SMMEs, ensuring that its research and development activities are closely aligned with the real needs of industry. This is achieved through various engagement models, including joint technology development agreements, contract research, technology licensing, public-private partnerships, and targeted support for SMMEs. The CSIR’s approach is to act as both a technology partner and a flexible resource for industry, providing access to multidisciplinary expertise, advanced facilities, and intellectual property.

Advanced manufacturing and digitalisation are at the heart of the CSIR’s modernisation agenda. The plan supports the adoption of cutting-edge technologies such as additive manufacturing (3D printing), automation, robotics, and digital platforms. By working with industry to modernise production processes and enable the transition to Industry 4.0, the CSIR helps South African manufacturers improve quality, productivity, and global competitiveness. This also includes supporting the development and localisation of new materials, smart factories, and digitally enabled manufacturing systems.

The plan places a strong emphasis on **sectoral support and value chain development**. The CSIR targets key manufacturing sectors, including chemicals, metals, machinery, automotive, medical devices, and food processing, providing technical support, product development, and process optimisation. The goal is to strengthen entire value chains, from raw materials to finished products, and to foster collaboration between established firms and emerging enterprises.

A distinctive feature of the CSIR Manufacturing Plan is its focus on **SMME enablement and horizontal platforms**. Rather than providing one-on-one support to individual small businesses, the CSIR develops scalable, horizontal platforms, such as digital traceability systems, quality assurance tools, and market access solutions, that can benefit large numbers of SMMEs simultaneously. This approach is designed to lower barriers to entry, promote inclusive growth, and empower small businesses to participate in high-value manufacturing.

Technology transfer and commercialisation are also key components of the plan. The CSIR licenses technologies to industry, supports the creation of spin-off companies, and facilitates the commercialisation of innovations developed in its labs. Incubation and technical support are provided to help SMMEs and entrepreneurs bring new products to market, ensuring that research outputs translate into real economic impact.

Finally, the plan recognises the importance of **skills development and workforce training**. The CSIR offers training programmes and upskilling opportunities to ensure that the manufacturing workforce is prepared for new technologies and processes. This is essential for building a future-ready manufacturing sector that can adapt to changing global trends.

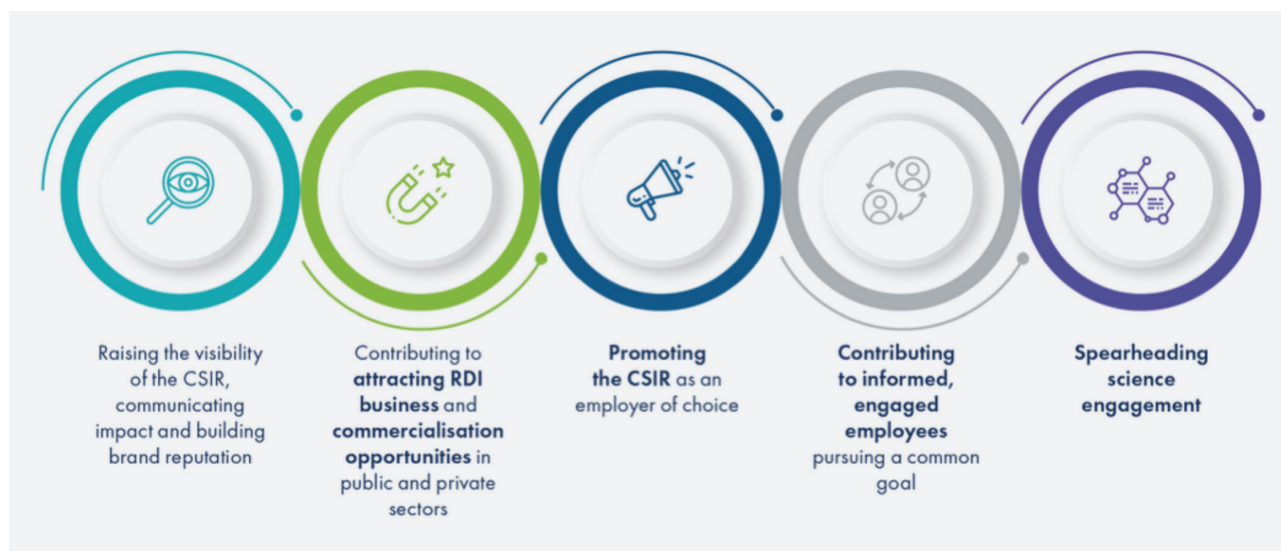
Table A5: Elements of the CSIR Manufacturing sector Plan

Focus area	Key activities and offerings	Intended impact/outcome
Business development	Industry engagement, partnerships and joint R&D	Increased private sector R&D and relevance
Advanced manufacturing	3D printing, automation, digitalisation and Industry 4.0	Modernised and competitive manufacturing
Sectoral support	Technical support and product/process optimisation	Value chain development, job creation
SMME enablement	Scalable platforms and digital tools, quality assurance	Inclusive growth and SMME empowerment
Technology transfer	Licensing, commercialisation and incubation	Innovation diffusion and new enterprises
Skills development	Training and workforce upskilling	Future-ready manufacturing workforce

MARKETING IN SUPPORT OF BD&C

For the CSIR to succeed in improving the competitiveness of high-impact industries, localising transformative technologies and driving socioeconomic transformation, it needs to raise its profile among key target audiences/stakeholders. To this end, the CSIR Communication and Marketing Strategy outlines how the organisation must communicate with its stakeholders in support of the activities undertaken by the BD&C function. The aim is to influence new clients to buy the services and innovations while retaining existing ones and forging new partnerships for medium to long-term relations. The focus is to employ innovative, creative and effective communication solutions and support business development objectives; buttressed by a sound understanding of the organisation’s work and role within the NSI, as well as the organisation’s evolving RD&I strategy. The CSIR Strategic Communication and Marketing Strategy has five objectives.

Figure A15: CSIR Strategic Communication and Marketing Strategy



STRATEGIC PARTNERSHIPS IN AFRICA

The CSIR's Africa partnerships are increasingly seen as a cornerstone for advancing science and technology across the continent and positioning South Africa as a regional innovation leader. The CSIR's role should extend beyond national boundaries, leveraging its multidisciplinary expertise and infrastructure to support industrial clusters, SMMEs, and mission-driven innovation initiatives throughout Africa. This regional approach is not only aligned with the priorities of international funders and development agencies, which often prefer to support cross-border collaboration, but also responds to the growing need for African solutions to African challenges in areas such as health, energy, agriculture, and digital transformation.

A key opportunity for the CSIR lies in building collaborative ecosystems with universities, science councils, and private sector entities across Africa. By fostering partnerships that address shared challenges, such as infrastructure development, energy transition, health innovation, and climate resilience, the CSIR can facilitate knowledge exchange, capacity building, and the commercialisation of technologies tailored to African contexts. For example, the CSIR's platforms in precision agriculture, health diagnostics, and renewable energy could be scaled and adapted for use in other African countries, amplifying impact and supporting local economic development. These partnerships will open doors for joint research projects, workforce training, and the establishment of regional observatories or knowledge hubs.

The CSIR's engagement will be strategic and focused, acting as a neutral and trustworthy coordinator that brings together diverse actors to tackle complex problems and drive impact at scale. This includes participating in continental research platforms, supporting regional policy dialogues, and contributing technical expertise to pan-African initiatives such as the AfCFTA and Africa CDC's health programmes. The CSIR's existing relationships with organisations like the African Union, regional development banks, and multinational companies provide a strong foundation for expanding its footprint and influence across the continent.

Successful Africa partnerships require deliberate strategy, investment, and attention to governance. The CSIR will ensure that its engagements are aligned with both South African and continental priorities, delivering tangible benefits for all partners. This involves advocating for supportive policies, securing sustainable funding, and maintaining high standards of transparency and accountability. The CSIR will balance the pursuit of large-scale, horizontal interventions, such as digital platforms or regional manufacturing hubs, with targeted support for high-impact sectors and local innovators.

The African RTO Network is envisioned as a unifying platform to advance STI across the continent. Its mission is to bring together African RTOs to translate research into industrial impact, support the implementation of continental strategies like STISA 2034 and Agenda 2063 and provide policy advice to the African Union. By fostering collaboration, setting technical standards, and building capacity, the network aims to address key challenges in health, agriculture, climate change, digitalisation, infrastructure, and energy, while catalysing industrial development and innovation.

Drawing on global best practices from other international RTO networks, the African RTO Network seeks to combine effective policy advocacy, global collaboration, and national cohesion. The proposed governance structure includes a Governing Council of RTO leaders, an Advisory Board with policy experts and donors, an Executive Secretariat for operational management, and thematic working groups focused on priority sectors. The founding secretariat will be hosted by CSIR (South Africa) for the first five years, with plans for annual continental forums and a phased roadmap for mobilisation, pilot implementation, and consolidation.

To ensure sustainability, the network will pursue initial seed funding from relevant instruments while medium-term funding could come from a membership model, project overheads, commissioned services, and sponsorships. The network aims to position itself as a formal implementation tool for continental STI strategies, strengthening Africa's innovation ecosystem and industrial competitiveness.

STRATEGIC PARTNERSHIPS WITH HIGHER EDUCATION INSTITUTIONS

The CSIR places strong emphasis on the importance of collaboration with Higher Education Institutions (HEIs) as a cornerstone for strengthening South Africa's innovation ecosystem. The landscape of innovation has evolved from linear models to complex ecosystems, where multiple actors, academia, industry, government, research organisations, and civil society, must interact in coordinated ways. The CSIR is ideally positioned to integrate knowledge creation for industrial and societal application. The

CSIR plans to act as a national integrator, moving beyond ad hoc engagements to structured partnerships and programmes that position both the CSIR and HEIs as co-leaders in South Africa’s innovation future.

Existing collaborations between the CSIR and HEIs include joint research and development projects, collaborative consortia, and the pooling of expertise and resources to address national missions. By working together, the CSIR and HEIs can accelerate innovation, avoid duplication, and ensure that research efforts are strategically focused on the country’s most pressing challenges. Human resource development is also a key area, with collaborations helping to build both the skilled pipeline for the CSIR and the broader talent pool needed for industrial development.

THE PARLIAMENTARY GRANT

The PG is a crucial source of funding for the CSIR, enabling it to fulfil its mandate of conducting multidisciplinary research and technological innovation. This grant supports the CSIR’s efforts to foster industrial and scientific development in South Africa, contributing to the improvement of the quality of life for its citizens. The funding provided through the PG allows the CSIR to undertake strategic research projects, develop transformative technologies and collaborate with various stakeholders, including the private and public sectors.

Additionally, the PG ensures the financial sustainability of the CSIR, allowing it to maintain and enhance its research infrastructure, invest in human capital development, and support the commercialisation of innovations (Table A6). This funding is essential for the CSIR to achieve its strategic objectives, including improving the competitiveness of high-impact industries, driving socioeconomic transformation, and supporting the development of a capable state. Overall, the PG plays a vital role in enabling the CSIR to drive innovation and contribute to South Africa’s industrial and economic growth.

Table A6: PG Investment Framework

PG investment/allocation categories	PG investment subcategories
PG baseline investment in divisions/ clusters	Division 1: Advanced Chemistry and Life Sciences
	Division 2: Advanced Production and Security
	Division 3: Smart Society
PG baseline allocation to portfolios/ support functions	Business Excellence and Integration (BEI)
	Legal Compliance and Business Enablement
	Finance ICT and Strategic Procurement
	Human Capital and Strategic Communications
Capability development initiatives	Research Centres
	New Capability Development Strategic Initiatives
	Research Infrastructure
	Human Capital and Skills Development
Commercialisation and technology transfer	Accelerator Fund
	Apex Fund
	Commercialisation Vehicle
Other Strategic Initiatives	Legal services provision
	Environmental Health and safety
	Employee health and well-being
	Strategic communications
CSIR Board and CSIR governance structures	CSIR Board and other CSIR governance committees

A.2.12.7. CSIR C³'S TECHNOLOGY COMMERCIALISATION AND INVESTMENT STRATEGY

CSIR C³ is the CSIR's dedicated vehicle for technology commercialisation, established to bridge the gap between research outputs and market impact. Its core mission is to take promising innovations developed within CSIR and facilitate their journey into the marketplace, either by licensing intellectual property to external partners or by investing directly in new startups and spin-out companies. This dual approach allows CSIR C³ to be flexible, adapting to the needs of different technologies and market opportunities.

CSIR C³ operates in a particularly challenging environment; most of the technologies emerging from CSIR are "pre-revenue" and fall into the category of "deep tech". These are innovations that require substantial technical validation, regulatory approval, and often significant capital investment before they can be commercialised. Unlike software or fintech startups, "deep tech" ventures typically have longer development cycles and higher risks, which makes them less attractive to traditional South African venture capitalists.

To address these challenges, CSIR C³ has adopted a portfolio approach. It works closely with CSIR's business development and cluster teams to identify technologies with commercial potential. Once identified, CSIR C³ triages these opportunities, assessing their readiness for investment and the likelihood of successful market entry. Investments are structured around clear milestones, with funding released as projects achieve technical or commercial objectives. This milestone-based approach helps manage risk and ensures that resources are allocated efficiently.

CSIR C³'s investment horizon is notably longer than what is typical in the venture capital industry. While most VCs look for exits within five to seven years, CSIR C³ recognises that deep tech projects may require seven to ten years or more to reach maturity. This means that CSIR C³ is prepared to provide extended support, not just in terms of funding but also management expertise and technical assistance. Many early-stage ventures lack complete teams or market experience, so CSIR C³'s role will extend to nurturing startups, helping them build the capabilities needed for success.

A key part of CSIR C³'s strategy is to leverage partnerships and co-investment networks. The subsidiary actively seeks collaboration with venture capital firms, private equity, government agencies, and international funders. Co-investment is crucial, especially for projects that require large capital injections, such as scaling up biotech or manufacturing innovations. By sharing risk and pooling resources, CSIR C³ can support more ambitious projects than would be possible alone.

The broader role of C³ as a national innovation hub will be explored. Beyond commercialising CSIR's own technologies, CSIR C³ is positioned to support innovation from other public institutions, including universities and TVET colleges. This could involve joint labs, shared infrastructure, and talent development pipelines, further strengthening South Africa's innovation ecosystem.

CSIR C³ aims to commercialise around 15 technologies over five years, raise substantial co-funding, and establish key partnerships both locally and internationally. Its success depends on balancing short-term wins with long-term bets, maintaining a robust pipeline of market-ready innovations, and rigorously reviewing projects to ensure that resources are focused on those with the greatest potential for impact.

A.2.13 GOOD GOVERNANCE

Inherent in the CSIR mission is the pursuit of inclusive and sustainable advancement in industry and society. Beyond leading innovation and providing unique solutions to address South Africa's challenges, the impact we seek is to improve lives and this translates to the wider obligation of the CSIR to operate as a responsible corporate citizen. The CSIR must duly comply with all legal imperatives, whether constitutional, national or common law, with due regard to the governance implications for CSIR business. South Africa is also a signatory to several international treaties and several international strategies inform the work of the CSIR.

Corporate social responsibility is entrenched within our EPIC value system. It is our obligation to carefully consider the interests of all our stakeholders and the environment within which we operate to ensure that we appreciate the social and environmental consequences of our business activities. In support of the CSIR's corporate citizenship strategy, critical emphasis will continue to be placed on the following initiatives:

- Enhanced implementation of the compliance function as part of our combined assurance model to more effectively manage risks associated with compliance, business ethics and fraud prevention;
- The enhancement of safety, health and environmental practices through integrated collaboration with all internal and external stakeholders to pursue zero harm;
- The active pursuit of strategies to improve the CSIR's carbon footprint against a trajectory of continuous improvement; and
- Contributions to B-BBEE, based on **the dtic** codes of good practice, with a specific focus on the critical role that the youth of South Africa must play in shaping our economy.

DEPARTMENT OF PLANNING, MONITORING AND EVALUATION (DPME) STATE-OWNED ENTITY (SOE) SELF-ASSESSMENT SURVEYS

The CSIR notes a few issues identified during the 2024 DPME SOE Self-Assessment Survey. The administrative issues have been addressed in the 2025 self-assessment; other issues that arose due to the nature of the organisation and issues with the survey questions themselves have been addressed formally with the DPME and will be work in progress to be reported on accordingly in the annual reports.

Table A7: Strategic RD&I initiatives in support of MTDP Priorities^a, ERRP Priority Interventions^b and Decadal Plan's Key Economic Sectors^c

No.	Strategic initiative description	Envisaged impacts
1. Future Production: Chemicals cluster		
1.1	Advanced Materials Developing nanostructures and advanced materials such as polymers, fibres, cosmetics, and energy materials, as well as devices for local industries	<ul style="list-style-type: none"> Developing nanostructures and advanced materials (polymers, fibres, cosmetics, energy materials) as well as devices for local industries, including support for industry and SMMEs for the full value chain of product development from research to prototyping
1.2	Biomanufacturing Technologies Developing and commercialising biotechnologies through facilities like the Biomanufacturing Industry Development Centre (BIDC) and its African Biomanufacturing Workforce Training and Skills Development Programme	<ul style="list-style-type: none"> Support for sustainable chemical production through bioprocessing and biopharmaceuticals, as well as biocatalysis and biorefinery capabilities, targeted towards SMME and industry support in product development
1.3	JET Sustainable process and technology development support	<ul style="list-style-type: none"> Focus on process development in clean hydrogen, emissions abatement and decarbonisation technologies in support of the chemicals, energy and allied industries as well the country's drive towards net zero CO₂ emissions by 2050

No.	Strategic initiative description	Envisaged impacts
2. Advanced Agriculture and Food cluster		
2.1	Smart Agriculture 4IR technologies for supporting small-scale farmers - Supporting industries along the agricultural value chain with actionable farm-level data or intelligence to enable precision agriculture and cost-effective business decisions (yield predictions, climate impact modelling, etc.) at all levels of the value chain	<ul style="list-style-type: none"> Increase the efficiency of crop production in the era of climate variability Increase the contribution of small-to-medium-scale growers Understanding the movement in the price of crops, with implications for food security, profitability and logistics
2.2	Agroprocessing Development of complementary or IKS medicines based cosmetics and food products, extraction of cannabinoids and formulation of cannabis-related product types with SMMEs and big companies, value addition of food waste streams to address food waste in a circular economy model, as well as the establishment of a metabolomics platform for the high-throughput analysis of metabolites to support product development, quality control, and agricultural innovation	<ul style="list-style-type: none"> Introduction of IKS-based products into the market and the development of the rural economy Establish two distinct value-chains for cannabis industrialisation, e.g. hemp and medicinal cannabis industries Develop and promote uniform (international) standards for production and processing to ensure compliance with health standards, quality products and commercialisation. Support evidence-based decision-making, e.g. Clinical Trials for new, high-quality medicinal cannabis products Contribute to the development of the South African circular economy. Management of waste for sustainable development. Enhanced product quality, safety, and authenticity, leading to increased consumer trust and market access.
2.3	SABER platform A national software system that integrates biosecurity, biosafety, disease surveillance and epidemiology across the entire agricultural value chain	<ul style="list-style-type: none"> The SABER platform will facilitate real-time reporting, visualisation and will integrate artificial intelligence (AI) to enhance the country's capabilities for biosecurity, biosafety, surveillance and epidemiology of pests and diseases across the entire agricultural value chain. This technology will positively impact agricultural production and economic growth, particularly for small-holder farmers who are most severely affected by disease outbreaks.

No.	Strategic initiative description	Envisaged impacts
3. NextGen Health cluster		
3.1	Vaccine Manufacturing and Innovation Develop local capabilities to manufacture vaccines and biologics	<ul style="list-style-type: none"> The goal is to establish local capability to manufacture pharmaceuticals originating from local research and development. This will address the current gap in pharmaceutical manufacturing and enhance pandemic preparedness
3.2	Next-Generation Molecular Diagnostics Developing and deploying advanced diagnostic technologies to address both human and veterinary health needs	<ul style="list-style-type: none"> Provide rapid, real-time detection at the POC setting, thus producing quick decision-making and better disease management
3.3	Development of Tools for Drug Development, Personalised medicines and Pharmacovigilance Creating tools for precision cancer treatments, pharmacovigilance and drug development	<ul style="list-style-type: none"> To enhance health outcomes and maximise the return on investment for health through patient appropriate treatment, and enabling the regulator to better monitor particular products deployed in our market

No.	Strategic initiative description	Envisaged impacts
4. Defence and Security cluster		
4.1	Defence-related Technologies Develop defence technologies in support of the SANDF mandate and for broader defence technology needs	<ul style="list-style-type: none"> To enhance RD&I in the fields of aerodynamic test and evaluation, space, stores integration, air operations and airborne autonomous systems through upgrading software and hardware components of the Wind Tunnel facilities. Competitive and innovative national surveillance and situational awareness capability Applied operational research, development and innovation in support of Special Operations maritime, airborne and landwards capabilities Homegrown identity management, cyber and information security solutions and approaches to securely identify and protect people (cradle to grave) and systems (physical and digital) against vulnerabilities, threats and risks Market competitiveness of the industries and operation effectiveness of user through collaborative technological innovations on forensic of energetic materials, protections, firepower, vehicle mobility and dismounted systems.
4.2	Information and Cybersecurity Capabilities Establish a world-class National Information and Cybersecurity capability	<ul style="list-style-type: none"> Upscale the Virtual Security Operation Centre to provide a consolidated cybersecurity situational awareness capability for government, municipalities, the private sector and the wider African market Locally developed and implemented multimodal identity technologies for secure and reliable identity recognition of people and intangibles Homegrown law enforcement and security cluster solutions are deployed and used for national security Supporting government, municipalities, and private sector in improving their information and cybersecurity governance, privacy and trust

No.	Strategic initiative description	Envisaged impacts
4. Defence and Security cluster		
4.3	<p>Civil Security Solutions Building the capabilities to combat crime</p>	<ul style="list-style-type: none"> • Reduction of the following crime-related challenges: <ul style="list-style-type: none"> • cash-in-transit crimes; • cyber/digital crimes; • illegal border crossings; • illicit mining; • infrastructure-related crimes; and • social unrest; threats to community safety and wildlife crimes • Increased interoperability within the security cluster • Integration of the CMORE situational awareness platform into SOE and other government departments' operational environments • Develop a security operational concept to address this risk and lead to a reference security architecture that can be used nationally for crime intelligence protection

No.	Strategic initiative description	Envisaged impacts
5. Future Production: Manufacturing cluster		
5.2	<p>Industrial Machinery and Equipment Support and enhance the localisation of products within South African industry by developing internationally competitive technologies and products for local manufacture through reverse engineering, systems design engineering, multi-disciplinary design optimisation, and the implementation of a through lifecycle product development framework</p>	<ul style="list-style-type: none"> • Strengthened local supply chains; increased industrial self-reliance; higher local content and value addition • Competitive products and technologies developed with industry, increase in locally designed and manufactured products exported. (e.g. Metalix, Mobile LSP, ViMo2.0, NMISA, Blockchain calibration system) • Contribute towards technology and product localisation in support of the dtic's masterplans. • Increased joint product development with industry • Fewer but larger technology and product development programmes. Result in more products with export potential • Stimulate re-industrialisation through local innovation and manufacturing with increased licensing income. • Improved industry competitiveness and potential for companies to be included in global supply chains
5.4	<p>Medical Devices Manufacturing and Health Sector Strategy Unlock a role for the CSIR in the MedTech Masterplan, build sector networking, focus on healthcare funding streams, innovate in medical devices, support SMMEs in MedTech, and increase regulatory knowledge</p>	<ul style="list-style-type: none"> • Strengthens innovation and grows the local medical device industry. • Improves healthcare access, affordability, and outcomes for patients and caregivers. • Reduces imports, boosts exports, and promotes local manufacturing to create jobs. • Enhances sector sustainability and strategic independence. • Lowers public healthcare costs and improves citizens' health and economic participation. • Drives inclusive growth and economic transformation through localisation and skills development. • Positions South Africa as a continental leader in MedTech via the African Continental Free Trade Area • Commercialization of the Umbiflow device. • Business case development and CE mark process for the Cardiflo device • Special mobility equipment for children with cerebral palsy • Establish framework for the commercialization of the TB diagnostics tool

No.	Strategic initiative description	Envisaged impacts
5. Future Production: Manufacturing cluster		
	<p>Rail Industry Development Initiative Development and deployment of key technologies in rollingstock, infrastructure, operations, maintenance, safety and security</p>	<ul style="list-style-type: none"> • Modernise rail transport through the development and deployment of new technologies. • Promote localisation of rail components and systems, supporting re-industrialisation and job creation. • Preserve and grows employment across the rail value chain—from operators to maintainers and infrastructure managers. • Improve transport security and operational efficiency, especially in heavy haul corridors. • Increase freight volumes, ensuring sustainability and profitability for rail clients. • Reduce infrastructure recovery and replacement costs, benefiting both operators and the national infrastructure owner. • Support an innovation-enabled capable state through reliable freight transport. • Drive economic transformation by strengthening local industry and reducing reliance on imports.

No.	Strategic initiative description	Envisaged impacts
6. Future Production: Mining cluster		
6.1	<p>Decarbonisation and Carbon optimisation Initiative Development of a decarbonisation programme for the mining industry, which focuses on technologies that support green mobility</p>	<ul style="list-style-type: none"> • Contribute to the decarbonisation of the mining industry • Develop high-impact decision-support information, studies, and tools for the mining industry • Catalyse the local consumption of low carbon Hydrogen • Encourage further local decarbonisation of other industries associated with mining • Supporting local SMMEs to participate in the clean energy transition
6.2	<p>Digital Technologies and Innovation as a Service Develop significant capability in system integration and digital platforms that support the integration of systems used by various original equipment manufacturers (OEMs) and software providers in the mining industry</p>	<ul style="list-style-type: none"> • Drive value for the mining industry, reduce systems in use where information and data are duplicated • Contribute towards simplifying systems and digital platforms • Reduce system costs • Develop a system integrating platforms • Supporting the industry with their key innovation challenges
6.3	<p>Safety and Health Initiative Develop high-impact decision-support tools to assist in decision-making for mining operators and management</p>	<ul style="list-style-type: none"> • Improve planning and monitoring of mining operations for process optimisation • Provide operational decision support • Contribute towards the Zero Harm objective of the Mining Industry • Develop new technologies and processes to support a safe work environment

No.	Strategic initiative description	Envisaged impacts
7. NextGen Enterprises and Institutions cluster		
7.1	<p>Smart Government Services Leverage digital technologies and data to increase the capability of the state and improve service delivery</p>	<ul style="list-style-type: none"> • National Electronic Medical Record for primary healthcare and Core Information systems for National Health Insurance (NHI) • Extension of the National Oceans and Coasts Information management System (OCIMS) applications across the continent (through the African Union Commission) • Provide software support and digital public infrastructure to implement the key priority initiatives of the South African Digital Transformation Roadmap • Use of e-Participation technologies to improve the participation of the public in government and policy modelling and formulation • Ensure Digital and Geographical Sovereignty through investing in local digital infrastructure, implement strong data governance and compliance frameworks, and foster local innovation to reduce dependence on foreign technology • Affordable private localised cloud offering to organs of state and SMMEs • Electronic monitoring (ankle) bracelets for parolees to lower government costs, improve operational efficiencies, foster technology localisation and enhance safety • Improved online radiation monitoring for the National Nuclear Regulator and improved technology localisation
7.2	<p>Financial Inclusion and Intelligence Bolster the financial sectors' resilience, competitiveness and coverage through technology enablement</p>	<ul style="list-style-type: none"> • FATF alignment and capable state: Local chain-analytics and fraud/intelligence services to support AML/CFT, supervision, investigations and policy • Financial inclusion at scale: AI bias detection/remediation to promote fair lending/insurance pricing; micropayments to lower access barriers for consumers and SMMEs • Data sovereignty and localisation: National Financial Data Hub (sovereign, POPIA-aligned) to reduce reliance on foreign tech, lower cost, and retain sensitive data onshore • Trusted, interoperable infrastructure: Standardised data schemas, shared services and APIs enabling quicker compliance checks, faster investigations, and reusable components across regulators and industry • Economic competitiveness and jobs: New local IP, exportable services, and specialised skills (AI, data engineering, regtech/fintech) supporting a modern, reindustrialised digital economy • Risk-aware financial system: Geospatial/AI models for wildfire/flood risk to inform underwriting, pricing and capital allocation; earlier alerts reduce losses and improve resilience

No.	Strategic initiative description	Envisaged impacts
7. NextGen Enterprises and Institutions cluster		
7.3	<p>Digital Economy Enablement Unlock the transformative power of next-generation technology to support the digital economy</p>	<ul style="list-style-type: none"> • Localised digital technologies/capabilities as foundational pillars of the digital economy • Open RAN solutions to reduce ICT imports and cost of ownership • Sustainable and environmentally friendly 5G and beyond mobile communication • Universal access to connectivity, information, education, and services enabled through spectrum sharing and human language technologies • Private sector adoption of Generative AI and Natural Language Processing (NLP) solutions across key domains • Creation and orchestration of an NLP ecosystem in South Africa • Digital skills development and training initiatives

No.	Strategic initiative description	Envisaged impacts
8. Smart Places cluster		
8.1	<p>Human Settlements, Utilities and Services Develop tools, products and materials to support the planning and production of resilient, sustainable, and spatially transformed human settlements and living environments that ensure energy and water security, climate adaptation, and equitable access to secure land and adequate housing.</p>	<ul style="list-style-type: none"> • Co-develop with stakeholders a platform for “Integrated Decision Support for Sustainable Urban Planning” from idea to to proof-of-concept stage • The integrated decision support tool will enable data-driven decision-making, such as aligning planning and budgeting with detailed demand projections and guiding investment strategies to mitigate risks of infrastructure loss due to climate change and climate hazard events
8.2	<p>Industrial Revitalisation Programme Support industrial revitalisation and the transition to a low-carbon, climate-resilient and globally competitive industry</p>	<ul style="list-style-type: none"> • Competitive, compliant, sustainable industrial companies and sectors • Improved resource use by industry, including the adoption of a Just (Energy) Transition. • Access to data, tools and technology to drive the transition to low-carbon, resource efficiency and circular economy • Mainstreaming of eco-industrial methodologies • Policy environment that enables inclusive and sustainable industrial development • Development of national and international standards for new technologies in the energy, water and waste management sectors, ensuring safety, performance, and environmental compatibility • Comprehensive training programmes and educational initiatives to upskill and reskill the workforce, making them adept

No.	Strategic initiative description	Envisaged impacts
8. Smart Places cluster		
8.3	<p>Ocean, Coastal and Marine Science and Port Operations</p> <p>Developing technologies that optimise water governance, as well as contribute sustainable ports</p>	<ul style="list-style-type: none"> Improving the protection and management of natural water sources (e.g. rivers) by municipalities (the aim of this SPP), has numerous benefits for human-wellbeing, the economy and the environment. Such benefits include supporting public health and well-being, ensuring the sustainability of water resources for industry and other users and the maintenance of ecological integrity. Supporting multi-purpose port systems that are environmentally and socially responsible while remaining economically viable Strengthening ports' 'license to operate' in globally competitive market increasing requiring environmental and social accountability

No.	Strategic initiative description	Envisaged impacts
9. Smart Mobility cluster		
9.1	<p>Intelligent Transport Systems and Operations</p> <p>Development of methods, systems, models and technologies to advance the sustainable transport agenda, utilising the core disciplines of transport and traffic engineering, transport economics, structural engineering, ICT, data science, computer engineering and software development</p>	<ul style="list-style-type: none"> A safe, accessible and efficient transport network
9.2	<p>Transport Infrastructure Engineering</p> <p>Development of engineering and technological solutions for efficient and effective design, construction, maintenance and management of mobility infrastructure for operational sustainability, climate adaptation and resilience while endorsing circular economy principles throughout the sector</p>	<ul style="list-style-type: none"> Improved safety and efficiency of ports and protected coastal zones; smart and resilient road and rail infrastructure
9.3	<p>National Logistics System</p> <p>Enhanced functioning of the national logistics system, which is critical for industrialisation and competitive local and international trade</p>	<ul style="list-style-type: none"> Measurable and predictable logistics performance across industry sectors critical for economic growth at macro and micro levels

- a MTDP Strategic Priorities – Inclusive growth and job creation, Reduce poverty and tackle the high cost of living, A capable, ethical and developmental state.
- b ERRP Priority Interventions – Infrastructure investment and delivery; energy security; gender equality and economic inclusion of women and youth; industrialisation through localisation; support for the recovery and growth of the tourism, cultural and creative industries; green economy interventions; mass public employment interventions; strengthening agriculture and food security; macro-economic policy interventions.
- c Decadal Plan's Key Economic Sectors Addressed - Modernising Manufacturing, Modernising Agriculture, Modernising Mining, Digital Economy, Circular Economy, Health Innovation, Energy Innovation, Innovation-enabled Capable State

A.3 KPI TARGETS

Table A8: Five-year KPI targets

Indicator	Target 2025/26	Target 2026/27	Target 2027/28	Target 2028/29	Target 2029/30	Target 2030/31
SO1: Conduct RD&I of transformative technologies and accelerate their diffusion						
KPI 1: Publication equivalents	300	356	361	366	366	380
KPI 2: New priority patent applications filed	6	6	12	15	16	17
KPI 3: New patents granted	9	11	13	14	17	19
KPI 4: New technology demonstrators	58	68	68	70	74	80
KPI 5: Number of technology licence agreements signed	14	14	21	25	27	31
SO2: Improve the competitiveness of high-impact industries to support South Africa's re-industrialisation by collaboratively developing, localising and implementing technology						
KPI 6: Number of localised technologies	10	21	33	39	46	53
KPI 7: Number of joint technology development agreements being implemented for industry	33	38	49	62	71	80
KPI 8: Number of SMMEs supported	115	109	131	140	152	162
SO3: Drive socioeconomic transformation through RD&I that supports the development of a capable state						
KPI 9: Number of reports contributing to national policy development	17	24	28	34	34	40
KPI 10: Number of standards delivered or contributed to support of the state	9	11	15	18	22	23
KPI 11: Number of projects implemented to increase the capability of the state	117	134	154	164	168	178
SO4: Build and transform HC and infrastructure						
KPI 12: Total SET staff	1642	1642	1659	1677	1698	1715
KPI 13: Percentage of SET staff who are black	72%	72%	72%	73%	73%	73%
KPI 14: Percentage of SET staff who are female	40%	40%	40%	41%	41%	41%
KPI 15: Percentage of SET staff with PhDs	19%	19%	19%	20%	20%	21%
KPI 16: Total chief researchers	20	20	24	27	31	34
KPI 17: Percentage of chief researchers who are black	30%	30%	38%	44%	45%	44%
KPI 18: Percentage of chief researchers who are female	20%	20%	33%	37%	35%	35%

Indicator	Target 2025/26	Target 2026/27	Target 2027/28	Target 2028/29	Target 2029/30	Target 2030/31
KPI 19: Total principal researchers	195	175	185	194	203	210
KPI 20: Percentage of principal researchers who are black	40%	40%	42%	43%	44%	48%
KPI 21: Percentage of principal researchers who are female	23%	25%	27%	30%	32%	35%
KPI 22: Number of staff involved in exchange programmes with industry	31	34	38	44	45	49
KPI 23: PPE investment (Rm)	165	170	174	178	181	178
SO5: Diversify income, maintain financial sustainability and good governance						
KPI 24: Total income (Rm)	3207	3299	3357	3441	3490	3540
KPI 25: Net profit (Rm)	(30.8)	(9.8)	15.9	23.3	40.7	44.1
KPI 26: South African public sector income (% total income)	59%	58%	58%	58%	58%	58%
KPI 27: South African private sector income (% total income)	8%	8%	9%	9%	9%	9%
KPI 28: International contract income (% total income)	11%	11%	10%	10%	10%	11%
KPI 29: B-BBEE rating	1	1	1	1	1	1
KPI 30: RIR	≤0.3	≤0.2	≤0.2	≤0.1	0	0
KPI 31: Audit opinion	Unqualified audit opinion	Unqualified audit opinion	Unqualified audit opinion	Unqualified audit opinion	Unqualified audit opinion	Unqualified audit opinion

A.4 KPI DEFINITIONS

KPIs provide an understanding of performance in terms of inputs, outputs and efficiencies and, to some extent, provide lead indicators of the outcomes and impact that are required for the CSIR to fulfil its mandate. The question of whether the CSIR is meeting its strategic objectives related to achieving outcomes and impact cannot be resolved by KPI assessment alone and requires a process of programme evaluation as described in the National Evaluation Policy Framework. The strategic objectives provided in the CSIR Strategic Plan make specific statements on planned outcomes that will serve as the basis for future evaluation of performance in this regard. The CSIR KPIs provide a basket of measures that reflect various aspects of the organisation's performance. The targets that are set reflect, in the context of limited resources, a strategic choice about the areas in which the greatest impact can be achieved.

KPI 1: PUBLICATION EQUIVALENTS

Indicator title	Publication equivalents
Definition	Publication equivalents consist of peer-reviewed journal articles, peer-reviewed conference papers, peer-reviewed book chapters and books.
Purpose	Research publications are a measure of the CSIR's research capabilities and outputs. The quantity and quality of peer-reviewed research publications is a measure of the quality and depth of the scientific knowledge base.
Performance assessment	The CSIR considers a performance equal to or above 95% of the target as acceptable. Performance in excess of the target is a positive result.
Data source/eligible evidence	Publications are entered in the CSIR Technical Outputs Database (TOdB), which provides the information for reporting.
Data responsibility	BEI: CSIR Information Services.
Method of calculation	The number of publication equivalents assigned to each type of publication as per the approved Publication Equivalent Guidelines. The publications are counted over the calendar year preceding the year in which the financial year ends.
Limitations	Authors submit publications for inclusion in TOdB via WorkFlow. There may be some under-reporting if individual authors do not submit their manuscripts for inclusion. However, there are also measures in place to automatically include publications whose authors are affiliated to the CSIR.
Type of indicator	Output.
Exclusions	Publications not submitted to the TOdB will not be allocated publication equivalents. Publications not subjected to scholarly peer review.

KPI 2: NEW PRIORITY PATENT APPLICATIONS FILED

Indicator title	New priority patent applications filed
Definition	A priority patent is the first patent application filed for the protection of a particular invention with the CSIR named as an applicant/assignee/co-applicant/co-assignee.
Purpose	The basic purpose [of the right of priority] is to safeguard, for a limited period, the interests of a patent applicant(s) in their endeavour to obtain international protection for their invention. At the CSIR, priority patent filings serve as a pipeline indicator of patent families.
Performance assessment	The CSIR considers a performance equal to or above 75% of the target as acceptable. Performance in excess of the target is a positive result.
Data source/eligible evidence	Knowledge Sharing Systems (KSS) records containing evidentiary supporting documentation (from patent attorneys, patent offices and/or reliable patent databases) offices.

Data responsibility	BEI: Intellectual Property and Technology Transfer.
Method of calculation	Number of qualifying records on KSS.
Limitations	Steps must be taken to avoid double counting of applications that have been previously filed but withdrawn and refiled at a later date (despite obtaining a new priority number and priority date).
Type of indicator	Output.
Exclusions	<ul style="list-style-type: none"> Any patent application that is not the first application filed in respect of a particular invention, including (without limitation) re-filings/conversions/nationalisations/continuations/divisional and so forth of a previously filed application. Patent applications for which evidentiary supporting documentation is lacking. Patent applications that do not name the CSIR as an applicant/assignee/co-applicant/co-assignee.

KPI 3: NEW PATENTS GRANTED

Indicator title	New patents granted
Definition	Patents are exclusive rights granted for inventions granted by an examining patent authority with the CSIR named as an applicant/assignee/co-applicant/co-assignee.
Purpose	Patents provide a lead indicator of the potential impact to be achieved when technologies are commercialised.
Performance assessment	The CSIR considers a performance equal to or above 80% of the target as acceptable. Performance in excess of the target is a positive result.
Data source/eligible evidence	KSS records containing evidentiary supporting documentation (from patent attorneys, patent offices and/or reliable patent databases).
Data responsibility	BEI: Intellectual Property and Technology Transfer
Method of calculation	<ul style="list-style-type: none"> Number of qualifying records on KSS. For patents from the same patent family granted in multiple territories, each patent granted by an examining authority is counted individually. Where a patent is granted by a regional patent authority (e.g., EPO), only the EPO grant is counted, not the national validations in designated countries. In cases where notification of a patent is only received after the results for the financial year have been completed, that patent will be included in the subsequent financial year's results. Only co-owned patents or patents in the name of the CSIR are counted.
Limitations	South Africa and certain other countries do not have examining patent offices. Therefore, patents filed in these countries are not counted for this KPI. The time taken for a patent to be granted after filing is unpredictable and can range from one to eight or even more years, depending on the efficiency of the patent authority concerned and the complexity of the examination process.
Type of indicator	Output.
Exclusions	<p>Patents granted by non-examining patent authorities.</p> <p>Patents for which evidentiary supporting documentation is lacking.</p> <p>Patents that do not name the CSIR as an applicant/assignee/co-applicant/co-assignee.</p> <p>Patents that are national validations of a patent granted by a regional patent authority.</p>

KPI 4: NEW TECHNOLOGY DEMONSTRATORS

Indicator title	New technology Demonstrators
Definition	A prototype, a rough example of a conceivable technology (product or system) derived from existing knowledge gained from research and/or practical experience as proof of concept.
Purpose	Measure an intermediate output of RD&I activities with the potential to be developed further and that can be transferred for socioeconomic impacts.
Performance assessment	The CSIR considers a performance equal to or above 85% of the target as acceptable. Performance in excess of the target is a positive result.
Data source/eligible evidence	All data are collated in a centralised repository of the Technology Demonstrator Evaluation Panel.
Data responsibility	BEI: RD&I Office.
Method of calculation	Technology demonstrators are submitted by clusters for adjudication to the Technology Demonstrator Evaluation Panel. Count of technology demonstrators as approved by the Technology Demonstrator Panel and adjudicated according to the CSIR Technology Demonstrator Evaluation Framework.
Limitations	None.
Type of indicator	Output.
Exclusions	Only outputs that result from experimental development are considered technology demonstrators, e.g. development of frameworks is not considered.

KPI 5: NUMBER OF TECHNOLOGY LICENCE AGREEMENTS SIGNED

Indicator title	Number of licensed technologies
Definition	A licence agreement is an agreement in terms of which the CSIR grants rights to another party to exploit IP developed by the CSIR, typically in exchange for royalty payments and/or other licence fees. Technologies licensed in this manner must have been disclosed via the invention disclosure process.
Purpose	This indicator is a measure of the uptake of CSIR IP in the market. Technology licences facilitate commercialisation by other parties of the CSIR's scientific and technological outputs.
Performance assessment	The CSIR considers a performance equal to or above 75% of the target as acceptable. Performance in excess of the target is a positive result.
Data source/eligible evidence	Copies of signed licence agreements and records in KSS.
Data responsibility	BEI: Intellectual Property and Technology Transfer
Method of calculation	<ul style="list-style-type: none"> • Number of licence agreements signed. • Technology licences are proposed and negotiated with other parties by CSIR divisions and are approved and granted in accordance with relevant legislation and the CSIR Commercialisation and Approval Frameworks. • Assignments of IP shall also be included if all other criteria are met, if the assignment is not a conversion of licenced rights to the same IP that have already/previously been licensed to the assignee.
Limitations	None.
Type of indicator	Output.
Exclusions	Only full licence agreements negotiated and concluded with another party are counted. This KPI excludes: <ul style="list-style-type: none"> • Instant access licences; and • Evaluation agreements (or similar).

KPI 6: NUMBER OF LOCALISED TECHNOLOGIES

Indicator title	Number of localised technologies
Definition	A localised technology is a technology that has been invented or commercialised outside of South Africa and that has been or will be introduced/adapted in South Africa for the commercial or scientific benefit or a technology that has been locally developed as an import replacement.
Purpose	The indicator aims to diffuse technologies commercialised or industrialised from elsewhere in the world that have demonstrated potential to positively affect the competitiveness of industry upon competent adoption by users or is a strong candidate to be an input into innovation or improvements of other systems for improvement of industrial activities or capabilities of the state.
Performance assessment	The CSIR considers a performance equal to or above 75% of the target as acceptable. Performance in excess of the target is a positive result.
Data source/eligible evidence	<ul style="list-style-type: none"> • Evidence for localised technologies is reviewed by the Planning, Reporting, Monitoring and Evaluation sub-committee of the CSIR Opco and should include: • Proof that the technology originated from outside the borders of South Africa, such as licence agreements and intellectual property rights ownership, including in the case of expired or lapsed IP rights; and • An implementation report or technology package developed, or other relevant proof that the technology has been piloted or applied/implemented in local South African conditions.
Data responsibility	CSIR clusters. Central repository held by BEI: Institutional Planning.
Method of calculation	Number of technologies localised.
Limitations	<ul style="list-style-type: none"> • The agreement date may be before the current financial year. • The KPI can only be claimed once all eligible evidence is satisfied, which may span several years.
Type of indicator	Output.
Exclusions	Excludes a general list of technologies developed by CSIR R&D.

KPI 7: NUMBER OF JOINT TECHNOLOGY DEVELOPMENT AGREEMENTS BEING IMPLEMENTED WITH INDUSTRY

Indicator title	Number of joint technology development agreements being implemented with industry
Definition	A joint technology development initiative with an industry partner under a written agreement, where each party brings the needed capability for the development and implementation of the technology. A third party may fund the initiative. Industry refers to the private sector and public sector corporations (state-owned enterprises).
Purpose	This indicator measures the CSIR's technology development collaborations with industry partners with the intention to commercialise and industrialise.
Performance assessment	The CSIR considers a performance equal to or above 75% of the target as acceptable. Performance in excess of the target is a positive result.
Data source/eligible evidence	<ul style="list-style-type: none"> • A signed joint technology development agreement. • Proof of joint activities, such as joint R&D outputs (R&D reports, papers, patents, computer-aided design models, technology test reports and so forth); and • Proof of activities performed in the current financial year.
Data responsibility	Divisional and cluster BD&C. Central Repository maintained by BEI: Institutional Planning.

Method of calculation	<ul style="list-style-type: none"> • Industry includes private sector and public sector corporations (SOEs) that have a direct impact on/contribution to the economy in terms of commercial operations, delivery • of products, delivery of services, etc. These include, but are not limited to, the likes of Eskom, Transnet and Denel. • Number of signed agreements for joint technology development and implementation. • Number of active technology agreements in the current financial year.
Limitations	<ul style="list-style-type: none"> • This definition of the KPI does not differentiate between large joint projects involving many SET-base members and small teams. • This definition does not prescribe a minimum ratio of hours contributed by each party • (this ratio will change as projects progress through TRLs).
Type of indicator	Output.
Exclusions	<ul style="list-style-type: none"> • Pure contract R&D where there is no joint team with an industry partner. • Projects where there is no specific product or process development with industry. • Projects done with government departments.

KPI 8: NUMBER OF SMMEs SUPPORTED

Indicator title	Number of SMMEs supported
Definition	Support of SMMEs as described in the 2019 Revised Schedule 1 of the National Definition of Small Enterprise in South Africa (Government Gazette No. 42304 of 15 March 2019) under the National Small Enterprise Act, 1996 (Act 102 of 1996), read with the National Enterprise Amendment Act, 2003 (Act 26 of 2003) and the National Small Enterprises Act, 2004 (Act 29 of 2004) through the implementation of RD&I and technology interventions that contribute to SMMEs becoming more productive, efficient, and sustainable.
Purpose	The indicator measures the CSIR's contribution to socioeconomic development and industrialisation through the support of SMMEs.
Performance assessment	The CSIR considers a performance equal to or above 75% of the target as acceptable. Performance in excess of the target is a positive result.
Data source/eligible evidence	<ul style="list-style-type: none"> • Signed agreement with the SMME; and • Proof of SMME status as per National Small Enterprise Act (from, e.g., Central Supplier Database (CSD) reports or a signed affidavit); and • An acknowledgment of delivery of support by the SMME or Proof of work done (e.g. a progress report, invoice and proof of payment, Minutes of meeting, etc.).
Data responsibility	CSIR clusters. Central repository maintained by BEI: Institutional Planning.
Method of calculation	The number of signed agreements with SMMEs. Assumption: even under third-party funding an agreement with a specific SMME should be in place.
Limitations	This is a proxy for impact measurement. Actual impact will only be available from SMME revenue, job growth, growth in number of SMME business contracts.
Type of indicator	Output.
Exclusions	Subcontracting of SMMEs, unless there is an agreement in place to do capacity development of the SMME to enable delivery.

KPI 9: NUMBER OF REPORTS CONTRIBUTING TO NATIONAL POLICY DEVELOPMENT

Indicator title	Number of reports contributing to national policy development
Definition	Evidence-based policy development support provided to various arms of government.
Purpose	The indicator measures the CSIR's support to government with evidence-based policy development and decision-making that can benefit from a significant SET input.
Performance assessment	The CSIR considers a performance equal to or above 75% of the target as acceptable. Performance in excess of the target is a positive result.
Data source/eligible evidence	<ul style="list-style-type: none"> • The policy report delivered; and • Acknowledgment of delivery of the policy report by the government department.
Data responsibility	CSIR clusters. Central repository maintained by BEI: Institutional Planning.
Method of calculation	Count of final reports related to new or updated policies received and accepted by the implementing government department. Work completed in the previous financial years but only signed-off in the current financial year will be counted.
Limitations	<p>The KPI as defined here does not account for:</p> <ul style="list-style-type: none"> • All national policies that do not have the same level of complexity from a SET point of view; and • The effort put in by the CSIR (SET hours), some policy development projects require less input than others.
Type of indicator	Output.
Exclusions	<ul style="list-style-type: none"> • Development of internal policies for government departments, for example general human resources policies, quality management policies and general management policies. • Contribution to creation or updating of CSIR policies.

KPI 10: NUMBER OF STANDARDS DELIVERED OR CONTRIBUTED TO IN SUPPORT OF THE STATE

Indicator title	Number of standards delivered or contributed to in support of the state
Definition	New or updated standards adopted by the state and SOEs that the CSIR has developed and delivered or to which it contributed. A standard is a published document that contains a technical specification, or other precise criteria designed to be used consistently as a rule, guideline, or definition. It provides target rules, guidelines or characteristics for products, services, or processes and production methods, including requirements as they apply to a product, service, process, or production method.
Purpose	The indicator measures the CSIR's support for government policy and regulation through the development of standardised practice guidelines across economic and social sectors
Performance assessment	The CSIR considers a performance equal to or above 75% of the target as acceptable. Performance in excess of the target is a positive result.
Data source/eligible evidence	<ul style="list-style-type: none"> • The standard delivered or contributed to; and • Acknowledgment of delivery of the standard by the government.
Data responsibility	CSIR clusters and portfolios. Central repository maintained by BEI Planning and Knowledge Management.
Method of calculation	Count of new or updated standards adopted by government. In the case of updated standards, significant changes from previous versions must be demonstrated. Examples of standards include interoperability standards, accessibility standards, products, or infrastructure standards. Work completed in the previous financial years but only signed-off in the current financial year will be counted.
Limitations	None.
Type of indicator	Output.
Exclusions	None.

KPI 11: NUMBER OF PROJECTS BEING IMPLEMENTED TO INCREASE CAPABILITY OF THE STATE

Indicator title	Number of projects implemented to increase the capability of the state
Definition	The CSIR-facilitated implementation of technologies (CSIR-created or otherwise) that improve the efficiency of government, SOEs and South African universities.
Purpose	This indicator measures the number of projects that the CSIR implements on behalf of the state.
Performance assessment	The CSIR considers a performance equal to or above 75% of the target as acceptable. Performance in excess of the target is a positive result.
Data source/eligible evidence	<ul style="list-style-type: none"> • An active agreement with a government department/SOE/South African university; or • An active agreement with a third party for work intended to increase the capability of the state; and • A progress report of the project being implemented on behalf of government institutions.
Data responsibility	CSIR clusters. Central repository maintained by BEI: Institutional Planning
Method of calculation	Number of projects the CSIR implements on behalf of the state.
Limitations	None.
Type of indicator	Output.
Exclusions	None.

KPI 12: TOTAL SET STAFF

Indicator title	Total SET staff
Definition	Number of CSIR staff qualified in the fields of SET.
Purpose	The indicator is a measure of the CSIR's capacity to deliver on RD&I projects.
Performance assessment	<ul style="list-style-type: none"> • Performance in terms of the number of SET staff is influenced by financial considerations and should be assessed in the context of financial performance. • The CSIR considers a performance equal to or above 95% of the target as acceptable.
Data source/eligible evidence	Number of SET staff extracted from PeopleSoft HR system.
Data responsibility	CSIR HC.
Method of calculation	Head count of SET staff at the end of the financial year.
Limitations	HC ensures the correct classification of staff in PeopleSoft.
Type of indicator	Output.
Exclusions	Bursars, visiting students/scientists and vacation work appointments.

KPIs 13 AND 14: PERCENTAGE OF SET STAFF WHO ARE BLACK AND FEMALE, RESPECTIVELY

Indicator title	Percentage of SET staff who are black and female
Definition	Percentage of SET staff who are black (as per B-BBEE Act definition) and percentage of SET staff who are female, respectively. South African citizens who are actively involved in RD&I activities. As per B-BBEE Act definition, black South Africans are Africans, coloureds and Indians, who meet the following criteria: <ul style="list-style-type: none"> • Citizens of the Republic of South Africa by birth or descent; • Became citizens of the Republic of South Africa by naturalisation before 27 April 1994; or • After 27 April 1994 and who would have been entitled to acquire citizenship by naturalisation prior to that date.
Purpose	These indicators measure the degree of demographic transformation within the RD&I capacity of the organisation.
Performance assessment	<ul style="list-style-type: none"> • Performance is influenced by the growth in SET staff numbers and may be negatively affected if the target number of SET staff is not achieved. • The CSIR considers a performance within two percentage points from the target as acceptable.
Data source/eligible evidence	Number of employees who are classified as black, as a percentage of the total SET staff extracted from PeopleSoft system.
Data responsibility	CSIR HC.
Method of calculation	The percentages of black South African and female South African staff of total SET staff at the end of the financial year.
Limitations	None – HC ensures the correct classification of staff on the Human Capital database.
Type of indicator	Output.
Exclusions	None.

KPI 15: PERCENTAGE OF SET STAFF WITH DOCTORAL QUALIFICATIONS

Indicator title	Percentage of SET staff with doctoral qualifications
Definition	Proportion of SET staff who have a doctoral level qualification.
Purpose	The indicator measures the organisation's capacity to conduct and supervise quality research and to innovate.
Performance assessment	<ul style="list-style-type: none"> • Performance is influenced by the growth in SET staff numbers and may be negatively affected if the target number of SET staff is not achieved. • A performance within one percentage point from the target will be considered as acceptable.
Data source/eligible evidence	Number of SET staff with PhD qualifications as a percentage of the total number of SET staff extracted from the PeopleSoft system.
Data responsibility	CSIRHC.
Method of calculation	The percentage of SET staff with doctoral-level qualifications at the end of the financial year.
Limitations	None – HC ensures the validity of data, and that evidence of the qualification is on file.
Type of indicator	Output.
Exclusions	None.

KPI 16: NUMBER OF CHIEF RESEARCHERS

Indicator title	Number of chief researchers
Definition	The number of CSIR staff recognised as chief researchers through the formal Career Ladder process.
Purpose	The indicator is a measure of the quality of SET capacity and their potential influence in the local and international RD&I spaces (capacity to collaborate and share resources).
Performance assessment	<ul style="list-style-type: none"> • Promotion or appointment at these senior research levels is based on growth in skill and proficiency as measured through the CSIR Career Ladder process. • A performance of equal to or above 90% of the target is considered acceptable.
Data source/eligible evidence	Total number of staff appointed as chief researchers as extracted from the PeopleSoft system.
Data responsibility	CSIR HC .
Method of calculation	Count of the number of SET staff who are classified as chief researchers at the end of the financial year.
Limitations	None – HC ensures the validity of data and that the required evidence is on file.
Type of indicator	Output.
Exclusions	Staff not recognised through the career ladder process.

KPIs 17 AND 18: PERCENTAGE OF CHIEF RESEARCHERS WHO ARE BLACK AND FEMALE, RESPECTIVELY

Indicator title	Percentage of chief researchers who are black and female
Definition	<p>The proportion of black (as per B-BBEE Act definition) South African and the proportion of female South African citizens who are Chief Researchers (as per CSIR’s Career Ladder process). As per the B-BBEE Act definition, black South Africans are Africans, coloureds and Indians who meet the following criteria:</p> <ul style="list-style-type: none"> • Citizens of the Republic of South Africa by birth or descent; • Became citizens of the Republic of South Africa by naturalisation before 27 April 1994; or • After 27 April 1994 and who would have been entitled to acquire citizenship by naturalisation prior to that date.
Purpose	These indicators measure the level of demographic transformation within the chief researcher level.
Performance assessment	<ul style="list-style-type: none"> • Promotion or appointment at these senior research levels is based on growth in skill and proficiency as measured through the CSIR Career Ladder process. • A performance of within five percentage points from the target is considered acceptable
Data source/eligible evidence	Percentages of chief researchers who are black and female, respectively, are extracted from the PeopleSoft system.
Data responsibility	CSIR HC.
Method of calculation	The percentage of black South African and female South African chief researchers at the end of the financial year.
Limitations	None – HC ensures the validity of data and that the required evidence is on file.
Type of indicator	Output.
Exclusions	None.

KPI 19: NUMBER OF PRINCIPAL RESEARCHERS

Indicator title	Number of principal researchers
Definition	Number of CSIR staff recognised as principal researchers through the formal Career Ladder process.
Purpose	The indicator is a measure of the quality of SET capacity and their potential influence in the local and international RD&I spaces (capacity to collaborate and share resources).
Performance assessment	<ul style="list-style-type: none"> • Promotion or appointment at these senior research levels is based on growth in skill and proficiency as measured through the CSIR Career Ladder process. • A performance of equal to or above 95% of the target is considered acceptable.
Data source/eligible evidence	Employees who have been appointed as principal researchers, as indicated on extracted from the PeopleSoft system.
Data responsibility	CSIR HC.
Method of calculation	Count of the number of SET staff who are classified as principal researchers at the end of the financial year.
Limitations	None. HC ensures the validity of data and that the required evidence is on file.
Type of indicator	Output.
Exclusions	Staff not recognised through the career ladder process.

KPIs 20 AND 21: PERCENTAGE OF PRINCIPAL RESEARCHERS WHO ARE BLACK AND FEMALE, RESPECTIVELY

Indicator title	Percentage of principal researchers who are black and female
Definition	Percentage of principal researchers who are black South Africans and percentage of Principal Researchers who are female South Africans. As per the B-BBEE Act definition, black South Africans are Africans, coloureds and Indians who meet the following criteria: <ul style="list-style-type: none"> • Are citizens of the Republic of South Africa by birth or descent; • Became citizens of the Republic of South Africa by naturalisation before 27 April 1994; or • After 27 April 1994 and who would have been entitled to acquire citizenship by naturalisation prior to that date.
Purpose	These indicators measure the level of demographic transformation within the Principal Researcher level.
Performance assessment	<ul style="list-style-type: none"> • Promotion or appointment at these senior research levels is based on growth in skill and proficiency as measured through the CSIR Career Ladder process. • A performance of within three percentage points from the target is considered acceptable.
Data source/eligible evidence	KPI information is extracted from the HC database.
Data responsibility	CSIR HC.
Method of calculation	The percentage of black South African and female South African principal researchers at the end of the financial year.
Limitations	None – HC ensures the validity of data and that the required evidence is on file.
Type of indicator	Output.
Exclusions	None.

KPI 22: NUMBER OF STAFF INVOLVED IN EXCHANGE PROGRAMMES WITH INDUSTRY

Indicator title	Number of staff involved in exchange programmes with industry
Definition	The exchange of staff between the CSIR and industry for a period of time to share/gain expertise for the advancement of business growth opportunities and capacity development.
Purpose	The indicator measures the level at which CSIR shares expertise and resources to strengthen collaborations with the industry to achieve organisational growth.
Performance assessment	The CSIR considers a performance equal to or above 75% of the target as acceptable.
Data source/eligible evidence	A signed transfer/secondment agreement.
Data responsibility	CSIR Human Capital.
Method of calculation	<ul style="list-style-type: none"> Industry includes private sector and public sector corporations (SOEs) that have a direct impact on/contribution to the economy in terms of commercial operations, delivery of products, delivery of services and so forth. These include, but are not limited to, the likes of Eskom, Transnet and Denel. Number of staff involved in exchange programmes for a minimum period of one month.
Limitations	None – HC ensures relevant data are captured.
Type of indicator	Output.
Exclusions	Exchange programmes with government departments.

KPI 23: INVESTMENT (RM) IN PPE

Indicator title	Investment in PPE
Definition	PPE investment is the amount invested in CSIR and government grant-funded PPE, as well as qualifying leases (as per Accounting Standard on Leases) for a financial year.
Purpose	This indicator provides a measure of the CSIR's investment in research infrastructure to develop and maintain world-class facilities and equipment to provide the quality of RD&I that is expected of it.
Performance assessment	The CSIR considers a performance equal to or above 95% of the target as acceptable. The budget target may be exceeded substantially, arising from additional grant funding. This is a successful result and is not the consequence of an inappropriate target.
Data source/eligible evidence	The information for the financial KPIs is obtained from the CSIR financial systems.
Data responsibility	CSIR Finance.
Method of calculation	The value of investment in PPE is the amount of CSIR and grant additions for the year. This information is obtained from reports in the fixed assets system, as well as the CSIR trial balance. Reconciliation is done to analyse the movement in the PPE balance and to break this down among additions, disposals and depreciation. This breakdown is also disclosed in the year-end annual financial statements.
Limitations	None.
Type of indicator	Input.
Exclusions	Equipment that goes back to the third party at the end of the project and is not logged in the CSIR asset list.

KPI 24: TOTAL OPERATING INCOME (RM)

Indicator title	Total operating income
Definition	Total operating income includes revenue declared on R&D contracts (contract R&D income), income derived from licences and royalties, PG received through the Science Vote and other income.
Purpose	The indicator reflects the ability of the CSIR to ensure financial sustainability. Growth in total operating income indicates growth in the outcomes and impact achieved by the CSIR.
Performance assessment	Performance on financial KPIs needs to be assessed in the context of the prevailing economic climate. The CSIR considers a performance equal to or above 95% of the target as acceptable.
Data source/eligible evidence	Total operating income measured in South African rand extracted from the Income Statement from the CSIR financial systems.
Data responsibility	CSIR Finance.
Method of calculation	<ul style="list-style-type: none"> • The CSIR annual trial balance from the financial system is updated for audit adjustments and the final figures are incorporated in the CSIR annual financial statements. • The annual financial statements are audited and the KPI results are derived from these audited annual financial statements.
Limitations	None.
Type of indicator	Output.
Exclusions	Net finance income is not included in the definition of total operating income.

KPI 25: NET PROFIT (%TOTAL INCOME)

Indicator title	Net profit (% total income)
Definition	Profit for a financial year is calculated as total operating income; less total operating expenditure (including the performance bonus accrual); plus, net finance income.
Purpose	Net profit is a key indicator of financial sustainability and the ability of the organisation to manage its expenses according to affordability determined by income levels.
Performance assessment	<ul style="list-style-type: none"> • Performance on financial KPIs needs to be assessed in the context of the prevailing economic climate. • The CSIR considers a performance equal to or above 95% of the target as acceptable. • Reducing the budget target is a successful result and is not the consequence of an inappropriate target.
Data source/eligible evidence	The information for the financial KPIs is obtained from the CSIR financial systems.
Data responsibility	CSIR Finance.
Method of calculation	<ul style="list-style-type: none"> • The CSIR annual trial balance from the financial system is updated for audit adjustments and the final figures are incorporated in the CSIR annual financial statements. • The annual financial statements are audited and the KPI results are derived from these audited annual financial statements.
Limitations	None.
Type of indicator	Output.
Exclusions	None.

KPI 26: SOUTH AFRICAN PUBLIC SECTOR INCOME (% TOTAL INCOME)

Indicator title	South African public sector income (% total income)
Definition	South African public sector income is the total income earned from South African government departments (i.e., national, provincial and local), constitutional entities, and public entities (as listed in the schedules to the PFMA). This includes revenue declared on R&D contracts (contract R&D income), directed/ring-fenced PG received through the Science Vote and any other forms of funding received from South African public entities.
Purpose	South African public sector income reflects the degree of public sector investment in the CSIR.
Performance assessment	<ul style="list-style-type: none"> • The CSIR's annual target is the percentage of South African public sector income included in the annual total operating income budget, which the CSIR aims to achieve or reduce. • Future targets are set to ensure increased income diversification and impact in other sectors. • The CSIR considers a performance equal to or above 95% of the target as acceptable.
Data source/ eligible evidence	The total income received from South African public organisations, as a percentage of total income, obtained from the PeopleSoft financial system.
Data responsibility	CSIR Finance.
Method of calculation	<ul style="list-style-type: none"> • The CSIR annual trial balance from the financial system is updated for audit adjustments and the final figures are incorporated in the CSIR annual financial statements. • The annual financial statements are audited and the KPI results are derived from these audited annual financial statements.
Limitations	None.
Type of indicator	Output.
Exclusions	None.

KPI 27: SOUTH AFRICAN PRIVATE SECTOR INCOME (% TOTAL INCOME)

Indicator title	South African private sector income (% total income)
Definition	South African private sector income is the total income earned from South African non-public entities (not listed as public entities in the schedules to the PFMA and the MFMA). This includes not-for-profit organisations. Licences, royalties and interest income are not included in the definition of South African private sector investment.
Purpose	South African private sector income reflects the degree of private sector investment in the CSIR.
Performance assessment	<ul style="list-style-type: none"> • Performance on financial KPIs needs to be assessed in the context of the prevailing economic climate. • The CSIR considers a performance equal to or above 95% of the target as acceptable.
Data source/eligible evidence	The total income received from South African private organisations, as a percentage of total income, obtained from the PeopleSoft financial system.
Data responsibility	CSIR Finance.
Method of calculation	<ul style="list-style-type: none"> • The CSIR annual trial balance from the financial system is updated for audit adjustments and the final figures are incorporated in the CSIR annual financial statements. • The annual financial statements are audited and the KPI results are derived from these audited annual financial statements.
Limitations	None.
Type of indicator	Output.
Exclusions	Licences, royalties and interest income are not included in the definition. Income from government departments.

KPI 28: INTERNATIONAL CONTRACT INCOME (% TOTAL INCOME)

Indicator title	International contract income (% total income)
Definition	International contract income is the total income earned from foreign customers (i.e. entities incorporated outside the borders of South Africa). This includes revenue declared on R&D contracts (contract R&D income) and other income received from foreign entities.
Purpose	International contract income reflects the global relevance of the CSIR. Growth in international investment is a key indicator of income diversification, as well as the relevance and impact of the CSIR within the global economy.
Performance assessment	<ul style="list-style-type: none"> • Performance on financial KPIs needs to be assessed in the context of the prevailing economic climate. • The CSIR considers a performance equal to or above 95% of the target as acceptable.
Data source/eligible evidence	<ul style="list-style-type: none"> • The information for the financial KPIs is obtained from the CSIR financial systems. • The total income received from foreign organisations, as a percentage of total income, obtained from the PeopleSoft financial system.
Data responsibility	CSIR Finance.
Method of calculation	The CSIR annual trial balance from the financial system is updated for audit adjustments and the final figures are incorporated in the CSIR annual financial statements. The annual financial statements are audited and the KPI results are derived from these audited annual financial statements.
Limitations	None.
Type of indicator	Output.
Exclusions	Licences and royalties received from foreign entities are not included in the definition of international contract income.

KPI 29: B-BBEE RATING

Indicator title	B-BBEE rating
Definition	A B-BBEE rating is a verification certificate issued by a SANAS-approved verification agency that determines the CSIR's contribution to black (as per the B-BBEE Act definition) economic empowerment.
Purpose	The indicator is a measure of the CSIR's compliance to the B-BBEE Act in its contribution to support socioeconomic transformation in South Africa.
Performance assessment	The CSIR would not consider failure to reach a target because of amended Codes of Good Practice targets as a negative result. Improving on the target is a successful result.
Data source/eligible evidence	B-BBEE certificate from a SANAS-approved verification agency.
Data responsibility	Legal and Compliance – Privacy office
Method of calculation	<p>B-BBEE rating is based on a certificate that is issued after an external auditing process. The B-BBEE certificate indicates the CSIR's status regarding a number of measurements as indicated in the B-BBEE Codes of Good Practice. The B-BBEE rating is a composite score that is made up of the following components:</p> <ul style="list-style-type: none"> • Management and control; • Skills development; • Preferential procurement; • Socioeconomic development; and • Equity ownership.
Limitations	The external audit ensures that there is no subjectivity in the B-BBEE assessment.
Type of indicator	Output.
Exclusions	As the CSIR is a government business enterprise, equity ownership does not contribute to the B-BBEE rating score.

KPI 30: RECORDABLE INCIDENT RATE

Indicator title	RIR
Definition	The Recordable Incident Rate (RIR) is the number of recordable incidences (or cases), multiplied by 200 000, divided by the number of hours worked. A recordable incident is a work-related injury or illness that results in one or more of the following criteria: <ul style="list-style-type: none"> • Death; • Loss of consciousness; • Restricted work or transfer to another job; • Days away from work; and/or • Medical treatment beyond first aid.
Purpose	<ul style="list-style-type: none"> • RIR indicates the effectiveness of the health and safety management system within the organisation in a year; • The CSIR SHEQ policy seeks to establish an effective, accountable and transparent framework for managing, maintaining and implementing SHEQ within the organisation.
Performance assessment	The CSIR aims to achieve its annual target of an RIR less or equal to 0.5 (equivalent to 16 recordable incidents/ cases) by identifying health and safety risks and implementing proactive health and safety interventions to reduce the number of recordable incidents/ cases.
Data source/eligible evidence	<ul style="list-style-type: none"> • Statistics of the recordable incidents that occurred at the CSIR, obtained from the SHEQ sub-portfolio. • The information for the health and safety KPIs is obtained from the CSIR SHEQ systems.
Data responsibility	CSIR SHEQ.
Method of calculation	The RIR is an indication of the percentage of employees exposed to work-related injury or illness and is classified as a recordable incident per year. It is calculated by the number of recordable cases multiplied by 200 000 divided by the number of hours worked.
Limitations	None.
Type of indicator	Output.
Exclusions	None.

KPI 31: AUDIT OPINION

Indicator title	Audit opinion
Definition	The Auditor-General defines a 'clean audit' as achieving an unqualified audit opinion on the audits of annual financial statements and pre-determined objectives, as well as not having material findings on the audit of compliance with laws and regulations.
Purpose	The indicator is a measure of CSIR's accountability and governance.
Performance assessment	The CSIR would like to maintain a clean audit outcome at the end of each annual audit.
Data source/eligible evidence	Report of the Auditor-General as published in the Annual Report.
Data responsibility	CSIR Finance.
Method of calculation	A clean audit is based on the overall opinion of the Auditor-General after the performance of the annual statutory audit.
Limitations	Data from the Auditor-General regarding the audit opinion are only available in the third quarter of the financial period. This KPI relates to the audit opinion of the previous financial year.
Type of indicator	Output.
Exclusions	None.



ANNUAL PERFORMANCE PLAN 2026/27

B.1 OPERATIONAL PLAN OVERVIEW

RD&I initiatives and projects planned for the 2026/27 FY are outlined in table B1 below. These initiatives aim to enhance technological advancements and foster collaborations with industry partners, HEIs, state entities and international organisations.

In the chemicals sector, the projects span advanced materials development, such as creating fibre-based products for greener automotive manufacturing and synthesising carbon nanomaterials from waste for use in polymers and coatings. There is a strong focus on biomanufacturing, including the commissioning of a unique facility for biopharmaceutical production, and several initiatives supporting the transition to a low-carbon economy, such as methane pyrolysis and clean coal technology demonstrations.

In agriculture, projects aim to provide actionable data for precision farming, develop cannabis extraction technologies, support the creation of complementary medicines and cosmetics from indigenous plants and improve food safety and waste management. Efforts are also underway to enhance agricultural biosecurity and disease surveillance through digital platforms.

Health-related initiatives include establishing infrastructure for vaccine manufacturing, advancing local vaccine and therapeutic development, deploying novel diagnostic platforms for infectious and chronic diseases and developing tools for drug development, such as a bioengineered liver and digital biobank.

Defence and security projects involve developing stealth UAVs, advanced command and control systems, AI-driven analytics, electronic warfare systems and cybersecurity infrastructure. There are also digital solutions for crime prevention, optimisation of intelligence capabilities and repurposing defence technologies for broader safety and security applications.

Manufacturing projects focus on advanced manufacturing, medical technologies, and rail systems to boost local industry competitiveness, healthcare solutions and infrastructure resilience. Mining initiatives target decarbonisation, digital integration for real-time tracking and risk profiling, and improved safety through new training tools and equipment.

Enterprise and institutional projects include developing national health information platforms, localised cloud infrastructure, digital tools for financial intelligence and tax compliance, blockchain analytics, and wildfire risk mapping. There is also significant investment in digital economy enablers such as AI, robotics, cloud computing, broadband connectivity, and 5G/IoT infrastructure.

Smart places projects address water reclamation, integrated monitoring systems, mobile apps for municipal services, acid mine water treatment, battery materials development, waste heat recovery, and coastal and marine science capabilities.

Mobility projects support intelligent transport systems, sustainable infrastructure, logistics optimisation and improved safety and efficiency in ports and roads.

Collaboration is a key theme, with partnerships across industry, higher education institutions, government agencies, international organisations, and SMMEs to drive innovation, commercialisation, and societal impact.

Table B1: RD&I initiatives and projects for 2026/27

Strategic Initiative	Programme/Project Description	Planned Technology Readiness Level by 31 March 2027	Planned Outputs for 2026/27	Collaborations: Industry, HEIs, other State Entities, International, Continental and BRICS Countries
1. Future Production: Chemicals				
1.1 Advanced materials	Grow-A-Car: developing the full value chain of fibre products from supply of fibre to processing and product development, to offtake, in order to allow for the greening of automotive value chains and localise manufacturing.	TRL 2-3.	The project will be able to demonstrate the following: <ul style="list-style-type: none"> • Supply of fibre • Offtake in automotive and potentially other markets • Product prototypes developed and accepted, with the exception of the envisioned biopolymer The project will then be searching for full implementation finance	<ul style="list-style-type: none"> • Main commercialisation partners: Coega Development Corporation, Eastern Cape Development Corporation, farmers co-operatives , VW, Isuzu, Brits Non-wovens, Mercedes-Benz
	Carbon Nanomaterials and their polymer nanocomposites: The development of processes to synthesise carbon nanomaterials from wastes and incorporate them in polymer matrices, thermosets and advanced coatings.	TRL 7	<ul style="list-style-type: none"> • Technology development and innovations will enable both the materials supply chains in SA and the industry that uses advanced materials to increase competitiveness 	<ul style="list-style-type: none"> • Collaboration already established: UJ and UP, and Filament Factory • Funding from TIA for the 25/26 and 26/27 financial years secured.
1.2 Biomanufacturing Technologies	Commissioning and regulatory approvals for the cGMP facility for biopharmaceutical manufacture. This facility positions the CSIR to bridge the gap between R&D and commercialisation in the biopharmaceutical value chain and will be the only facility of its kind in South Africa	N/A	<ul style="list-style-type: none"> • Facility will be fully commissioned and functional. • Systems and processes for cGMP operation developed. • Regulatory approval application submitted to SAHPRA 	<ul style="list-style-type: none"> • SAHPRA for regulatory approval • SevereGMP an international company with expertise in cGMP establishment that is being funded by the Wellcome Trust to assist in establishing cGMP capabilities in LMICs.

Strategic Initiative	Programme/Project Description	Planned Technology Readiness Level by 31 March 2027	Planned Outputs for 2026/27	Collaborations: Industry, HEIs, other State Entities, International, Continental and BRICS Countries
1.3 JET – Process Development and Support	Numerous projects that supports a just transition to a low carbon economy ranging from in-field demonstration (e.g. methane pyrolysis), equipment design and construction (e.g. Clean Coal Technology) and lab scale development (e.g. new CO2 utilisation projects)	Various TRLs	Outputs will include: <ul style="list-style-type: none"> • Engineering package for Clean Coal Technology and fund raising for a pilot facility • Demonstration of methane pyrolysis using actual feed gas 	<ul style="list-style-type: none"> • Planned collaborations: University of Stellenbosch, Coaltech, Horizon Europe, GreenQuest, Sasol, SANEDI / DSTI, Eskom

Strategic Initiative	Programme/Project Description	Planned Technology Readiness Level by 31 March 2027	Planned Outputs for 2026/27	Collaborations: Industry, HEIs, other State Entities, International, Continental and BRICS Countries
2. CSIR Advanced Agriculture and Food				
2.1 Smart Agriculture	Supporting industries along the agricultural value chain with actionable farm-level data or intelligence to enable precision agriculture and cost-effective business decisions (yield predictions, climate impact modelling, etc.) at all levels of the value chain	TRL >7	<ul style="list-style-type: none"> • 2 tech demos 5 publications 2 SMMEs supported 	<ul style="list-style-type: none"> • Private – FarmSol, InnovBiz, Wits, UKZN • Public – DSTI, TIA EDCD
2.2 Agroprocessing	Development of Cannabis extraction technologies to demonstrate local applicability of such technologies and formulation of innovative product types with SMMEs and big companies	TRL > 6	<ul style="list-style-type: none"> • Product formulations • Extraction of Cannabis-based active ingredients • Supporting SMMEs with product and process development 	<ul style="list-style-type: none"> • Private – Labat, Wits, UFS • Public – DSTI, TIA, DBSB, GDARD • International
	Development of complementary medicines, cosmetics and food products and assist companies navigate the IKS regulatory framework to ensure compliance and that the benefits accrued from commercialising IKS based products accrue to the indigenous knowledge holders	TRL > 4	<ul style="list-style-type: none"> • Assist communities with benefit sharing agreements • Valorisation of indigenous plants • Identification of active ingredients in indigenous plants 	<ul style="list-style-type: none"> • Private – THPs, Mashaba Herbs, UFS, UKZN, Univ of Limpopo, UNDP • Public – DSTI, TIA, IDC

Strategic Initiative	Programme/Project Description	Planned Technology Readiness Level by 31 March 2027	Planned Outputs for 2026/27	Collaborations: Industry, HEIs, other State Entities, International, Continental and BRICS Countries
	Addressing food safety to ensure compliance and population health, as well as development of food waste in a circular economy model and post-harvest management technologies	TRL 6	<ul style="list-style-type: none"> • Food testing methods • Establishment of accredited testing facilities • Innovative food waste management solutions 	<ul style="list-style-type: none"> • Private – Nozala Trust • Public – DSTI, TIA, • International – French Solidarity
2.3 SABER platform	Address agricultural biosecurity, disease surveillance and epidemiology challenges in an integrated manner	TRL 6+	<ul style="list-style-type: none"> • Development of a SABER Platform to enhance the already existing LITS platform • Integrate artificial intelligence (AI) into the system 	<ul style="list-style-type: none"> • DoA

Strategic Initiative	Programme/Project Description	Planned Technology Readiness Level by 31 March 2027	Planned Outputs for 2026/27	Collaborations: Industry, HEIs, other State Entities, International, Continental and BRICS Countries
3. CSIR NextGen Health				
3.1 Vaccine Manufacturing and Innovation:	Established as a CDMO , fit for purpose infrastructure funded through further support from National Treasury	Various	<ul style="list-style-type: none"> • Outputs of local research and development advanced into vaccines and therapeutics in clinical development or commercialised • Capability to make emergency vaccine supplies • The CSIR developed prototype vaccines for Hepatitis B virus (HBV), Human papilloma virus (HPV) and for Respiratory syncytial virus (RSV) going through clinical development via CSIR start-up 	<ul style="list-style-type: none"> • DSTI is at advanced stages of developing the Vaccine Innovation and Manufacturing Strategy (VIMS) to develop national capability develop vaccines and biologics.

Strategic Initiative	Programme/Project Description	Planned Technology Readiness Level by 31 March 2027	Planned Outputs for 2026/27	Collaborations: Industry, HEIs, other State Entities, International, Continental and BRICS Countries
3.2 Next-Generation Molecular Diagnostics:	<p>Deploy novel Lab-on-Chip Point-of-Care (LOC PoC) Diagnostics Platform for infectious and one health targets, as well as chronic disease</p> <p>Development of isothermal molecular diagnostic assays for priority diseases (e.g. TiLV, ISKNV, Brucellosis, Bovine Tb)</p>	Various	<ul style="list-style-type: none"> CSIR developed Lab-on-Chip devices for use in veterinary and aquaculture diagnostics fully deployed in regional markets The POC diagnostics end-to-end capability fully established at the CSIR 	<ul style="list-style-type: none"> Public – DSTI, TIA International – Ghana, Egypt, Malawi, Brazil, India, FAO, Cefas
3.3 Tools for drug development and pharmacovigilance	Production of minimal viable product (MVP) for the bioengineered liver, ACI, and Digibiobank	Project is at TRL 6 (Bioengineered liver, ACI (TRL 5), Digibiobank (TRL 3). Project will progress towards minimal viable product (MVP)	<ul style="list-style-type: none"> Outputs across the value chain are expected from publications, patents, technology demonstrators, MVP and joint technology development with industry 	<ul style="list-style-type: none"> DSTI, TIA, SAMRC, SAPHRA, GATES, WITS, Genentech, UCT, NHLS; Collaborators: Proteomics team

Strategic Initiative	Programme/Project Description	Planned Technology Readiness Level by 31 March 2027	Planned Outputs for 2026/27	Collaborations: Industry, HEIs, other State Entities, International, Continental and BRICS Countries
4. CSIR Defence and Security				
4.1 Technologies for Sovereign capabilities	Development of a Stealth Wing Flying Testbed AUV	TRL 6	<ul style="list-style-type: none"> A technology demonstrator developed and fly tested with a dummy payload 	<ul style="list-style-type: none"> SANDEF, SMME
	Cerberus Command and Control Systems	TLR 6	<ul style="list-style-type: none"> Integration of more CMORE services into the Cerberus Command and Control Systems and application of AI for large data analytics 	<ul style="list-style-type: none"> DFFE, DoD
	Development of an Open Identity Risk Observatory (OIRO)	TRL 6	<ul style="list-style-type: none"> A Data Analytics Framework for Monitoring and Predicting Identity-Related Risks 	<ul style="list-style-type: none"> SMMEs HEIs

Strategic Initiative	Programme/Project Description	Planned Technology Readiness Level by 31 March 2027	Planned Outputs for 2026/27	Collaborations: Industry, HEIs, other State Entities, International, Continental and BRICS Countries
	RDI projects under the DERI programme	TRL 6	<ul style="list-style-type: none"> • Application of AI and Machine learning into Command and Control Systems (C2S) • Deploy the Sensors and Electronic Warfare Simulation (SEWES) for SANDF usage • Development of the Foliage Penetration (FoPen) Radar capability • Development of the GSCR technology for border surveillance 	<ul style="list-style-type: none"> • Armscor, DoD, SANDF
	Development of electronic warfare (EW) systems	TRL 8	<ul style="list-style-type: none"> • Inundu Radar Threat Simulator developed, as well as demonstration of Inundu air-to-air combat training solution components / sub systems 	<ul style="list-style-type: none"> • BRICS, State entities, Industry, TIA
	Establishment of a Public Key Infrastructure Trust Centre and Digital Identity	TRL 6	<ul style="list-style-type: none"> • Development of an Open Identity Risk Observatory (OIRO): A Data Analytics Framework for Monitoring and Predicting Identity-Related Risks 	<ul style="list-style-type: none"> • SMMEs, HIEs, Other State Entities
4.3 Capabilities to combat crime	Provision of digital solutions and process automation in support of safety and security interventions (digital transformation).	TRL 8	<ul style="list-style-type: none"> • Prototypes developed 	<ul style="list-style-type: none"> • Transnet, SAPS & SOEs
	RDI support to the NATJOINTS	N/A	<ul style="list-style-type: none"> • MEIR sovereign capability implementation 	<ul style="list-style-type: none"> • Parliament/ Presidency/ DOJ / ICASA / SARS, National Intelligence Co-ordinating Committee (NICOC) stakeholders

Strategic Initiative	Programme/Project Description	Planned Technology Readiness Level by 31 March 2027	Planned Outputs for 2026/27	Collaborations: Industry, HEIs, other State Entities, International, Continental and BRICS Countries
			<ul style="list-style-type: none"> SIGINT capability optimisation 	<ul style="list-style-type: none"> NICOC stakeholders, State Security Agency (SSA)
	Identify opportunities to re-purpose existing defence technology solutions to be used during national safety and security interventions.	TRL 8	<ul style="list-style-type: none"> GSCR for SANParks, private security industry and BMA & DMRE (mining security) 	<ul style="list-style-type: none"> SANParks, Transnet, BMA
		TRL 6	<ul style="list-style-type: none"> SAR UAV - infrastructure protection, mining and border safeguarding 	<ul style="list-style-type: none"> Transnet, BMA

Strategic Initiative	Programme/Project Description	Planned Technology Readiness Level by 31 March 2027	Planned Outputs for 2026/27	Collaborations: Industry, HEIs, other State Entities, International, Continental and BRICS Countries
5. Future Production: Manufacturing				
5.1 Industrial Machinery & Equipment:	Development of QUViR, GasCAM, UBRD V5 technologies	TRL6-8	<ul style="list-style-type: none"> Technology deployment and commercialisation 	<ul style="list-style-type: none"> Industry partners, government agencies
	Production of Metalix AM machines, re-establishment of Aeroswift capacity	TRL 6-8	<ul style="list-style-type: none"> Machine deployment, post-processing technologies 	<ul style="list-style-type: none"> Local manufacturers
	Mechanical Testing & Qualification: Expansion of ISO 17025 accredited services; support for export readiness and product validation	TRL 9	<ul style="list-style-type: none"> Provision of Independent testing reports Increased industry uptake 	<ul style="list-style-type: none"> Local manufacturers; exporters
5.2 Medical Devices Manufacturing & Health Sector Strategy:	Medical Device Innovation: Umbiflow (TRL 8), development of the Cardiflow (TRL 6) business case for commercialisation and development of assistive mobility and TB detection devices (TRLs 3-4)	TRL3-8	<ul style="list-style-type: none"> Commercial readiness of Umbiflow, clinical validation and business case for the cardiflow device, prototyping of local medical devices. Medical device incubator proposal. 	<ul style="list-style-type: none"> Local health institutions, DOH, SAMRC, DSTI, Universities
	Biosensing Platforms: Smartphone and Arduino-based pathogen detection and pharmaceutical quality control	TRL 4-6	<ul style="list-style-type: none"> Development of technology demonstrators for proof of concept. 	<ul style="list-style-type: none"> SAHPRA, NHLS, Walter Sisulu University

Strategic Initiative	Programme/Project Description	Planned Technology Readiness Level by 31 March 2027	Planned Outputs for 2026/27	Collaborations: Industry, HEIs, other State Entities, International, Continental and BRICS Countries
5.3 Rail Industry Development Initiative	Development of TIMS (Train Infrastructure Monitoring System) and an In-train derailment detection system. Assessing the feasibility of laser cladding to extend the life of rail components.	TRL 4-6	<ul style="list-style-type: none"> Prototyping and testing TIMS and the In-train derailment system in operations. The testing and verification of at least one laser clad component in operations. 	<ul style="list-style-type: none"> Transnet (TFROC, TE, TRIM), PRASA, LeaseCo, local operators and possible international customers

Strategic Initiative	Programme/Project Description	Planned Technology Readiness Level by 31 March 2027	Planned Outputs for 2026/27	Collaborations: Industry, HEIs, other State Entities, International, Continental and BRICS Countries
6. CSIR Future Production: Mining				
6.1 Decarbonisation using Green Mobility in Mining Initiative:	Decarbonisation using Green Mobility in Mining Initiative: Development of a decarbonisation programme for the mining industry, which focuses on technologies that support green mobility.	TRL 4-5	<ul style="list-style-type: none"> Develop H2 FEED platform, which will include a demand estimator, various layers of technical information (e.g. Renewable Energy, Water Resource and potentially AMD) and high-level techno economics for hydrogen production. 	<ul style="list-style-type: none"> Mining Industry
6.2 Digital Integration Platforms:	Development of an underground spatial positioning system (E-PEG) to provide real-time location tracking of personnel, equipment and support units in underground mines and tunnels. The system uses ultra-wideband (UWB) technology to establish a "GPS-like" capability underground, enhancing safety, productivity, and digital integration across mining operations	TRL 8	<ul style="list-style-type: none"> Completion of MVP and field validation in operating mines System integration into digital mine infrastructure (REA, DUSAT, etc.) Finalisation of commercial software and user interface Preparation of global product licence documentation Investigation into local manufacturing and support capability in South Africa Technical publication 	<ul style="list-style-type: none"> Industry: Reutech Mining, Sibanye-Stillwater, Impala Platinum, Harmony

Strategic Initiative	Programme/Project Description	Planned Technology Readiness Level by 31 March 2027	Planned Outputs for 2026/27	Collaborations: Industry, HEIs, other State Entities, International, Continental and BRICS Countries
	Development of a novel platform for the South African mining industry rock engineering specialists in managing and executing typical practices required in the industry. Inclusion of a few critical applications including support design, auditing, research review, rock testing database	TRL 6	<ul style="list-style-type: none"> • Continued application development, Industry trials and a commercialisation plan • Industry trials on selected applications, followed by Industry Expansion as new applications are developed, with improvements of existing applications based on industry feedback 	<ul style="list-style-type: none"> • Local Mining Industry
	Development of the TMM Digital Twin as a digital risk profiling tool for Open Pit and underground mines	TRL 7	<ul style="list-style-type: none"> • Develop governance foundation for the TMM Digital Twin, such as documentation, processes and quality review. • Commercialisation related modules/ functionalities – including subscription framework, etc. • Develop additional modules: • UG module - allow for UG Mine use cases • Semi-Autonomous - for semi-autonomous vehicle enablement • Simulation - fleet management fundamental theory to support predictive functionality • Optimisation – optimisation scenario tool 	<ul style="list-style-type: none"> • Mining Industry

Strategic Initiative	Programme/Project Description	Planned Technology Readiness Level by 31 March 2027	Planned Outputs for 2026/27	Collaborations: Industry, HEIs, other State Entities, International, Continental and BRICS Countries
<p>6.3</p> <p>Safety and Health Initiative:</p>	<p>Fire and explosion survivability of installed underground safety and communication technology elements</p>	<p>TRL 4</p>	<ul style="list-style-type: none"> • Technology survey to establish the state of the art of fire/explosion survivability. • Literature review of test protocols/standards applicable to the field. • Develop/adopt a test protocol for the evaluation of fire and explosion survivability of equipment. 	<ul style="list-style-type: none"> • Fire risk management operators in the mining and building industries • Mines Rescue Services
	<p>Development of competency based immersive and experiential mine worker emergency response digital training tools</p>	<p>TRL 7</p>	<ul style="list-style-type: none"> • Operationalise the training offering. • Develop additional immersive training modules. • Develop training modules on contract for mining industry customers. 	<ul style="list-style-type: none"> • Local training content developers (SMMMEs)
	<p>Development of a novel chemical canister design aimed at improving the efficiency to achieve a more compact and lightweight self-contained self-rescuer</p>	<p>TRL 5</p>	<ul style="list-style-type: none"> • Validation of chemical canister, as part of an SCSR unit, through selected SANS 1737 tests. 	<ul style="list-style-type: none"> • Afrox
	<p>Data analytics applied to rope test database and rope visual inspection video analytics for improved insights and potential prediction of rope life/deterioration</p>	<p>TRL 4</p>	<ul style="list-style-type: none"> • At least one on-mine/laboratory video monitoring trial installation to demonstrate the technology. • Data analytics insights to support rope condition monitoring and/or rope life determination as a service offering. 	<ul style="list-style-type: none"> • Mining companies

Strategic Initiative	Programme/Project Description	Planned Technology Readiness Level by 31 March 2027	Planned Outputs for 2026/27	Collaborations: Industry, HEIs, other State Entities, International, Continental and BRICS Countries
7. CSIR NextGen Enterprises and Institutions				
7.1 Smart Government Services	Development of the national information platform to support the implementation of the National Health Insurance.	TRL6-9	<ul style="list-style-type: none"> • Electronic Medical Record for Primary Healthcare; • National Digital Health Interoperability Framework; • National Health Insurance Operating Model; • Digital Health Information Security assessments. 	<ul style="list-style-type: none"> • Centre for Disease Control and Prevention (CDC), National Department of Health (NDoH), National Health Laboratory Service (NHLS)
	Development of a localised cloud for the governments' Digital Public Infrastructure Project	N/A	<ul style="list-style-type: none"> • Pilot a localised cloud for the governments' Digital Public Infrastructure Project relating to the MzansiXchange Application 	<ul style="list-style-type: none"> • DPI, National Treasury, DHA, SITA
7.2 Financial Inclusion and Intelligence	Applying data science and analysis to identify unusual and suspicious banking and online transactional behaviours and patterns.	TRL 6	<ul style="list-style-type: none"> • A digital tool that automates detection and flagging of suspicious transactions in bank accounts. 	<ul style="list-style-type: none"> • Banking industry, Hawks Investigating Directorate
	Development of a digital asset tax tool calculate tax obligations of cryptocurrency traders and users	TRL 7/8	<ul style="list-style-type: none"> • Integration of the tool with cryptocurrency exchanges • Simplify tax reporting and generate aggregated market information for SARS 	<ul style="list-style-type: none"> • SARS, Financial services providers, Taxpayers, Tax consultants
	Development of blockchain analytics capabilities to detect illicit financial transactions	TRL 7	<ul style="list-style-type: none"> • Mapping tools to trace transaction paths on the Bitcoin and Ethereum blockchains, including label sets • Strengthen the South African financial system, and assist regulators and law enforcement. 	<ul style="list-style-type: none"> • Financial industry & regulators (local and global), Digital Assets industry, Policing services, Legal services
	Apply geospatial modelling and data science to the insurance industry to better manage the risks of wildfires	TRL 9	<ul style="list-style-type: none"> • Digital mapping tool with burn areas and veld age data that inform risk calculation of the probability and severity of wildfires, and their effects on insured assets. 	<ul style="list-style-type: none"> • Insurance industry

Strategic Initiative	Programme/Project Description	Planned Technology Readiness Level by 31 March 2027	Planned Outputs for 2026/27	Collaborations: Industry, HEIs, other State Entities, International, Continental and BRICS Countries
7.3 Digital Economy Enablement	Develop foundational digital capabilities and technologies for South Africa's digital economy	TRL 4-6	<ul style="list-style-type: none"> • A range of deliverables (R&D and HCD outputs) agreed with DSTI in 5 areas of focus (domains): AI, Robotics and Cybernetics; Cloud Computing, Networking and Advanced IoT; Blockchain and Cybersecurity; Augmented-, Mixed- and Virtual Reality; Modelling and Simulation • Digital skills development 	<ul style="list-style-type: none"> • DSTI & range of other Govt Depts, various HEIs, ICT SMMEs, Regulators; Relevant industry stakeholders, International, Continental and BRICS countries, SETAs • International, Continental and BRICS countries. • SparcX, FCDO, Matlala Group, SMMEs in online learning
	Derisking of deployment of NextGen Natural Language Processing (NLP) tools in customer environments –Scaling up of EdTech offerings –NLP ecosystem development	TRL 6-8	<ul style="list-style-type: none"> • NLP capabilities successfully deployed in customer environments • Language technology- and cloud-based early literacy and multimedia content-enablement solutions • Collaborative NLP projects and solutions 	<ul style="list-style-type: none"> • DSAC, DBE, Macmillan Education, Unisa, DHE, NSFAS
	Connecting the unconnected	TRL 6-9	<ul style="list-style-type: none"> • Wireless broadband connectivity scaled up (in partnership with funders, industry & SMMEs) • Technical support to Spectrum Switch licensees • Dynamic spectrum access and management system in the C- & S-band 	<ul style="list-style-type: none"> • MNOs (Vodacom, MTN, Cell C), MVNOs through MNOs, ICASA, SENTECH/BBI, SMMEs (Kutleng, Riot), Mines (Need to do needs analysis), Academic institutions, Communications Regulators' Association of Southern Africa (CRASA), Kagiso Trust

Strategic Initiative	Programme/Project Description	Planned Technology Readiness Level by 31 March 2027	Planned Outputs for 2026/27	Collaborations: Industry, HEIs, other State Entities, International, Continental and BRICS Countries
	Development of infrastructure to support 4G, 5G and beyond networks, Cloud & Edge computing, as well as IoT	RL 6-9	<ul style="list-style-type: none"> Successfully deployed and demonstrated 5G testbed on CSIR campus Deployed and active cloud platform to support RDI and localisation (data sovereignty) 	<ul style="list-style-type: none"> Senelec, Vodacom, MTN

Strategic Initiative	Programme/Project Description	Planned Technology Readiness Level by 31 March 2027	Planned Outputs for 2026/27	Collaborations: Industry, HEIs, other State Entities, International, Continental and BRICS Countries
8. CSIR Smart Places				
8.1 Human Settlements, Utilities and Services	Reclamation of effluent from a Wastewater Treatment Plant for Potable use	TRL 9	<ul style="list-style-type: none"> Design, construction and validation of a mobile pilot plant unit for the City of Cape Town 	<ul style="list-style-type: none"> UWC, UCT, CPUT, COCT, NMISA
	Development and implementation of an integrated water services delivery monitoring system	TRL 9	<ul style="list-style-type: none"> System developed for the Gauteng province. 	<ul style="list-style-type: none"> Siemens; COGTA, GIFA
	Development of mobile applications for municipal infrastructure incidents reporting/management	TRL 9	<ul style="list-style-type: none"> Further development of the mobile CARRS App (Software) 	<ul style="list-style-type: none"> Municipalities (incl. Vhembe DM; Moses Kotane LM); Bantsho
	Development of the decentralised wastewater treatment packaged plant	TRL 9	<ul style="list-style-type: none"> Plant developed for small communities 	<ul style="list-style-type: none"> Jawela Projects
	Valorisation of Acid Mine Water. Sustainable use of resources in the mining sector: Tailor-made a solution for the reclamation of drinking water and valuable minerals from acid mine water.	TRL 8	<ul style="list-style-type: none"> Further development of MASRO technology for the treatment of acid mine drainage Mobile and modular Pilot Plant 	<ul style="list-style-type: none"> Exxaro Resources, Seriti Coal Mine, UCT, Sibanye Stillwater, DWS, WRC
	Predicting near real time water requirements of fruit tree orchards.	TRL 6	<ul style="list-style-type: none"> Development of a Smartphone Water Use application 	<ul style="list-style-type: none"> Water Research Commission (WRC)

Strategic Initiative	Programme/Project Description	Planned Technology Readiness Level by 31 March 2027	Planned Outputs for 2026/27	Collaborations: Industry, HEIs, other State Entities, International, Continental and BRICS Countries
	Develop essential tools for Water Resources Analysis, Planning, and Management.	TRL 6	<ul style="list-style-type: none"> Develop and operationalise a Water curation system to make water data accurate, readily accessible, and fit for purpose. 	<ul style="list-style-type: none"> DWS, UKZN;
8.2 Industrial Revitalisation	Development of LiMn2O4 Cathode Material for Lithium-ion Batteries – LMO process	TRL 6	<ul style="list-style-type: none"> Prototype, techno-economic study report for piloting the process 	<ul style="list-style-type: none"> DSTI, IMR, UWC
	Development of Cathode Material for Lithium-ion Batteries (One pot synthesis)	TRL 4	<ul style="list-style-type: none"> Prototype, techno-economic study and reporting 	
	Development of a Zeolite waste heat recovery and drying system	TRL 6	<ul style="list-style-type: none"> Techno-economics study 	<ul style="list-style-type: none"> CER-advance
8.3 Ocean, Coastal and Marine Science and Ports Operations	Development of capability for enhancing CSIR offerings in coastal system earth observations, pollution monitoring, e-flows, and tools for guiding and measuring 5th generation green port development.	TRL 5-9	<ul style="list-style-type: none"> Establishment of New Laboratory capabilities/services 	<ul style="list-style-type: none"> UNEP, Transnet, WIOMSA, Nelson Mandela University

Strategic Initiative	Programme/Project Description	Planned Technology Readiness Level by 31 March 2027	Planned Outputs for 2026/27	Collaborations: Industry, HEIs, other State Entities, International, Continental and BRICS Countries
9. CSIR Smart Mobility				
9.1 Intelligent Transport Systems and Operations	Sensor science, digital twinning, software development, data management, analysis and visualisation, GIS modelling in support of the transport industry	TRL 4	<ul style="list-style-type: none"> • Integrated law enforcement management system • Traffic Control Centre Management System (TCCMS) • Infrastructure security and temper detection technologies • Heavy vehicle data analytics and reporting systems (enhanced VOMS) • Web based Abnormal load registration and permit system • Multi-Depth Deflectometer improvement 	<ul style="list-style-type: none"> • SMMEs: Think Ninjas, Datron • Law enforcement, RTMC • COGTA (metros, province, other authorities etc.)
	Provision of public transport systems design and creation of solutions to improve the performance of transport network operations and associated management systems	TRL 5	<ul style="list-style-type: none"> • A web-based road condition monitoring tool which aims to improve disaster response, supports urban planning, and enhances community resilience. • Eastern Cape Master plan for transport service centres 	<ul style="list-style-type: none"> • National Taxi Alliance (data collection, industry needs mapping) • South African National Taxi Council (data collection, industry needs mapping) • SA Taxi (future studies) • International Association on Public Transport (information exchange) • South African Roads Federation (contributor) • Committee of Transport Officials (invited as and when)

Strategic Initiative	Programme/Project Description	Planned Technology Readiness Level by 31 March 2027	Planned Outputs for 2026/27	Collaborations: Industry, HEIs, other State Entities, International, Continental and BRICS Countries
9.2 Transport Infrastructure Engineering	Provide sustainable road material sciences and infrastructure solutions that effectively address the accessibility, and mobility needs in support of socioeconomic development	TRL 6	<ul style="list-style-type: none"> • Pavement Asset Management Processes inventory and document management 	<ul style="list-style-type: none"> • SOE: SANRAL • Local Industry, e.g. consultants, material suppliers and contractors. SANRAL Research Panel Members • Industry associations, e.g. Sabita, CCSA and ASPASA • International: IT Transport, • Universities: UP, SU, UKZN
	Development of technologies and support systems that will improve the safety and efficiency of ports and protect coastal infrastructure	TRL 6	<ul style="list-style-type: none"> • Wave research: The influence of wave spectrum assumptions on breakwater performance. Adapting (y) for local conditions. • Physical model ship motions: Expand the research to include physical ship motion monitoring at ports 	<ul style="list-style-type: none"> • Industry: PRDW Consulting Ports and Coastal Engineers, WSP Africa (Pty) Ltd, CSV Construction, WML Coast • SMMEs: Enuvo, ASP Tech (Pty) Ltd, Jan se Company
9.3 National Logistics System	Enhanced functioning of the national logistics system	TRL 5	<ul style="list-style-type: none"> • Expand technology platforms (Logistics Observatory) and apply to more sectors (Ilima) • Logistics for specific sectors (agriculture; energy; health) • Report on green logistics 	<ul style="list-style-type: none"> • Economists: Conningarth • SMMEs & Solution developers: ThinkNinjas, Crickmay • Sector bodies: SAAFF, BUSA • Implementation: SMMEs – Mogan Bros • Universities: Stellenbosch

B.2 HUMAN CAPITAL DEVELOPMENT PLAN

B.2.1. HC ANNUAL PRIORITIES AND ROUTINE SERVICES

To achieve the fourth CSIR strategic objective (SO4), the CSIR has adopted five strategic pillars aimed at aligning the Human Capital Strategy and operational planning with the CSIR Strategy, vision, mission, and values. The human capital strategic pillars and key initiatives to deliver on the SO4 objectives for FY 2026/27 include:

1. BUILDING A DIVERSE TALENT ECOSYSTEM AND A SUSTAINABLE FUTURE SUPPLY OF LIMITED SKILLS

The following key interventions are planned for 2026/27 in support of this objective.

Table B2: Building a diverse talent ecosystem and a sustainable future supply of limited skills

Initiative	Intervention
Talent acquisition	<ul style="list-style-type: none"> The strengthening of internal capabilities for the attraction of talent continues to be a priority for the next year and this includes continuous optimisation of recruitment sourcing strategies, including joint appointments, to achieve a competitive advantage in the attraction of new talent with skills and competencies that match the diverse internal demand of skills and competencies, required by Divisions, Clusters, Impact Areas and Research Groups. Implementing measures to enhance candidate and employee experience.
Talent management and Succession Planning	<ul style="list-style-type: none"> Cascading talent and succession management to lower levels. Implementation of psychometric assessment. Targeted learning development for identified successors. Digital platform for succession planning.
Enhancing pipeline development programmes	<p>The CSIR will continue its pipeline development programmes such as the GIT, YES, WIL, Apprenticeship, and Internships, with an emphasis on youth employment. These initiatives prioritise transformation candidates, and the organisation has consistently achieved over 99% participation, a trend expected to continue in the 2026/27 FY. The detailed performance and targets for 2026/27 FY are reflected in table B3 below.</p> <p>Targeted initiatives will also include the following:</p> <ul style="list-style-type: none"> Improve return on investment from HCD programmes by ensuring good performance and facilitating absorption of pipeline. Three principal researchers under the ARDP are to be supported for the chief researcher level. Four senior researcher on the Accelerated Principal and Chief Researcher Development (APRDP) are to be supported for the principal researcher level. Finalise the recruitment of the CIDP programme. Increase the absorption of GIT, YES and WIL students.
Learning and development (L&D) programmes	<ul style="list-style-type: none"> Work towards the accreditation of the CSIR as a training service provider through the QTCO and relevant SETAs. Secure workplace approval for technical training through relevant SETAs. Development and approval of CSIR informal short courses to the respective NQF level. Approval of the mining innovation and learning centre framework. Partnership with NSF on skills development programmes.
CSI Programme	<ul style="list-style-type: none"> Expand the programme in partnership with multinationals, the Department of Small Business Development and banks (especially entrepreneurship). Maintain robust and active participation of CSIR employees in CSI initiatives.
Alumni programme	<ul style="list-style-type: none"> Roll out the planned activities as per the plan and deliver impact through the alumni programme initiatives. The planned initiatives include mentorship in the Entrepreneurship Development Programme, the alumni newsletter, and maintaining engagements with alumni and other CSIR stakeholders.

Table B3: Pipeline development programmes performance and targets for FY 2026/27

PIPELINE CATEGORY	31 Mar 23	31 Mar 24	31 Mar 25	2026/27 Target
Studentships	19	30	27	27
GITs	30	18	14	14
Interns	97	107	122	137
Post-Doctorate	3	8	12	16
YES Programme	74	68	65	65
WIL Students	0	19	8	8
Apprenticeship	0	0	0	26
Grand Total	223	250	248	293

2. STRENGTHENING LEADERSHIP AND DEEPENING PROFESSIONALISM

The following key interventions are planned for 2026/27 in support of this objective:

Table B4: Strengthening leadership and deepening professionalism

Initiative	Intervention
Embedding the CSIR people strategy	<ul style="list-style-type: none"> Continue embedding the CSIR People Strategy as a key priority for 2026/27 FY.
Targeted development programmes for critical staff	<ul style="list-style-type: none"> Targeted development for PhDs considering Recognition for Prior Learning (RPL). Focus on principal researcher leadership development. Development of finance skills, business development and IP management for researchers.
Targeted development programmes for leaders	<ul style="list-style-type: none"> Focus on RGL and IAMs on “What it takes to run the CSIR business”: Business acumen People management Strategic thinking Finance
Implement revised career ladders and launch the career paths for support	<ul style="list-style-type: none"> The automation of the experience navigator and linking to learning interventions. Embedding the RDL and consolidating the RDL ladder.
Develop exchange programmes with universities and industry	<ul style="list-style-type: none"> Continue to incorporate exchange programmes with the existing partnerships and stakeholders of the CSIR to ensure the sharing and transferring of skills.
Employee relations	<ul style="list-style-type: none"> Continue with employee relations capacity and capability building initiative, which is based on relevant legislation, policies and processes, to empower managers to understand and manage the employee relations processes effectively and expeditiously. Line manager execution of ER aspects/activities. People Management targeted at RGL, IAM levels. Focus on turnaround of distressed areas in terms of: <ul style="list-style-type: none"> Leadership aspects. Behavioural (culture). Management of performance and poor performance.
Employment Equity	<ul style="list-style-type: none"> Implement the Employment Equity Plan to ensure that the organisation achieves its annual objectives and sectoral numerical targets. In particular we have annumerated senior management and a workforce profile targeting for a period of five years in tables B5 to B7 below .

The CSIR is part of the professional, scientific and technical activities sub-sector and as result regulated by the sectoral targets, which long-term needs to reflect the NEAP (National Economically Active Population) of the country.

Table B5 : EE Sector Targets

Professional, Scientific And Technical Activities – 5 Year Sector Targets						
		Top Management	Senior Management	Professionally Qualified & Middle Management	Skilled Technical	Disability
Description	Gender	Designated Groups	Designated Groups	Designated Groups	Designated Groups	Disability
Sector Targets	Male	24.4%	29.9%	35.9%	49.8%	3%
	Female	38.1%	46.1%	46.1%	46.1%	
	Total	62.5%	76.0%	82.0%	95.9%	

An excerpt in summary of senior management occupational categories (Top and Senior Management). The targets for the Top Management and Senior Management occupational levels for the five-year period are as follows:

Table B6 : CSIR Top Management Targets

	Male				Female				Foreign Nationals		Designated			Grand Total
	A	C	I	W	A	C	I	W	Male	Female	Male	Female	Total target	
Representation - 30/6/2025	52.6	0.0	5.3	10.5	15.8	0.0	0.0	10.5	0	5.3	57.9	26.3	84.2	100
DoEL Targets %	24.4			-	38.1				-	-	24.4	38.1	62.5	
Targets 2025/26 year 1	10	0	1	2	3	0	0	2	0	1	11	5	16	19
%	52.6	0	5.3	10.5	15.8	0	0	10.5	0	5.0	57.89	25	84.2	100
Targets 2026/27 year 2	10	0	1	2	3	0	0	2	0	1	11	5	16	19
%	52.6	0.0	5.3	10.5	15.8	0.0	0.0	10.5	0	5.3	57.8	25	84.2	100
Targets 2027/28 year 3	10	0	1	2	3	0	0	2	0	1	11	5	16	19
%	55.0	0	5.3	10.0	15.8	0	0	10.5	0	5.0	57.8	25	84.2	100
Targets 2028/29 year 4	8	1	1	1	4	1	0	2	0	1	11	6	17	19
%	42.1	5.3	5.3	5.3	21.1	5.3	0.0	10.5	0%	5.2	52.6	36.9	89.5	100
Targets 2029/30 year 5	7	1	1	1	4	1	1	2	0	1	9	8	17	19
%	36.8	5.3	5.3	5.3	21.1	5.3	5.3	10.5	0%	5.3	47.3	42.1	89.5	100

Table B7 : CSIR Senior Management Targets

	Male				Female				Foreign Nationals		Designated			Total
	A	C	I	W	A	C	I	W	Male	Female	Male	Female	Total target	
Representation - 30/6/2025	34.0	4.9	7.8	17.5	8.7	1.0	0	11.7	11.7	2.9	46.7	21.4	68.1	100
DoEL Targets %	29.9			-	46.1				-	-	29.9	46.10	76.0	
Targets 2025/26 Year 1	35	4	8	19	9	2	1	12	10	3	45	27	72	103
%	34.0	3.9	7.8	17.9	8.7	1.0	0.9	11.6	9.7	2.9	42.45	25.4	67.9	100%
Targets 2026/27 Year 2	33	4	8	18	12	2	2	12	9	3	45	29	74	103
%	32.0	3.9	7.8	17.5	11.7	1.9	1.9	11.7	8.5	2.8	42.4	27.3	69.7	100
Targets 2027/28 Year 3	30	4	8	17	15	4	2	12	9	3	45	31	76	103
%	32.1	3.8	7.5	17.0	12.3	3.8	1.9	11.3	8.7	2.8	42.4	29.2	71.6	100
Targets 2028/29 Year 4	28	5	7	17	18	5	3	12	7	3	40	38	79	103
%	27.2	4.9	6.8	16.5	17.5	4.9	2.9	11.7	6.7	2.8	38.83	36.89	75.7	100
Targets 2029/30 Year 5	24	5	4	14	23	7	5	13	5	3	33	48	81	103
%	23.3	4.9	3.9	13.6	22.3	6.8	4.9	12.6	4.9	2.9	32.0	46.6	78.6	100

3. IMPROVING INDIVIDUAL AND ORGANISATIONAL PERFORMANCE

The following key interventions are planned for 2026/27 in support of this objective:

Table B8: Improving individual and organisational performance

Initiative	Intervention
Employee value proposition	<ul style="list-style-type: none"> • Implement Total Rewards Statements as a personalised communication tool to illustrate the monetary and non-monetary offerings to employees.
Performance management	<ul style="list-style-type: none"> • Further refinement of the 360 feedback questions to create a clearer link to the CSIR's values. • Drive management of performance and address poor performance especially in distressed areas as part of the turnaround process.
Employee engagement	<ul style="list-style-type: none"> • Focus on increasing employee engagements as a key driver for increased performance, productivity, and collaboration towards excellence will continue in the next year. • Rolling out of the second climate survey for the CSIR.
Reward and recognition	<ul style="list-style-type: none"> • Develop long term incentive scheme as a strategic management tool to promote attraction and retention of talent. • Retention of principal researchers, software engineers and cybersecurity specialists.
Employee benefits	<ul style="list-style-type: none"> • Ongoing campaigns and webinars to create awareness and educate employee on employees benefit offerings.

4. INCREASED EFFICIENCY AND EFFECTIVENESS OF HC SYSTEMS AND PROCESSES

The following key interventions are planned for 2026/27 in support of this objective:

Table B9: Increased efficiency and effectiveness of HC systems and processes

Initiative	Intervention
Enhance and automate HC processes	<ul style="list-style-type: none"> • Continue with the automation of key manual forms and processes and implement integrated solutions for workflow approvals. • Implement and socialise the following: <ul style="list-style-type: none"> – Interview application tool – Support portfolios Experience Navigator
Rewards and recognition	<ul style="list-style-type: none"> • Management of LTI scheme in BIS
Management and reporting on Learning activities	<ul style="list-style-type: none"> • Learning management system

5. ADVANCING WOMEN, YOUTH AND PEOPLE WITH DISABILITY

The following key interventions are planned for 2026/27 in support of this objective:

Table B10: Advancing women, youth and people with disability

Initiative	Intervention
Attraction and retention of female researchers	<ul style="list-style-type: none"> • Implementation of the developed attraction and retention framework concepts with the intention of reducing turnover of critical staff, including black and female researchers. • Continuation of Women’s Forum to keep female employees engaged while ensuring a conducive environment for success.
Youth dedicated programmes	<ul style="list-style-type: none"> • Through the bursary initiatives for staff and pipeline, the organisation supported 486 bursars in 2025 at undergraduates and postgraduates level and plans to maintain or grow this figure in FY 2026/27. • Work-based learning programmes for the youth play a critical role in addressing youth unemployment. The organisation has supported over 214 youths in 2025 through the YES, Internship, WIL, Post-Doctorate and apprenticeship programmes. • Through partnerships with SETAs and NSF, skills/professional development is prioritised for SET in the 2026/27 FY.
Advancement of people with disabilities	<ul style="list-style-type: none"> • Continuing to focus on the advancement of people with disabilities as per the CSIR’s Employment Equity Plan. Youth outreach with a focus on PWD schools/ associations, with priority for YES programme.
Women, men and youth forums	<ul style="list-style-type: none"> • Continue leveraging on the Women’s Forum to support women’s development agenda and implementing initiatives developed by women to create a conducive working environment. • Continue with men’s forum to address GBV issues, attitudes and psychosocial issues.

B.3 SCIENCE ENGAGEMENT AND PUBLIC AWARENESS

The 2024/25 performance demonstrated that science engagement is already a substantive area of work within the CSIR, supported by the CSIR Strategic Communication and Marketing Strategy (also see Figure A15). Achievements during the year include 43 outreach programmes where 35 000 learners/students were reached, 11 STEMI webinars, a National Science Week career event where we partnered with seven 1 to 3 quintile rural/township schools, 132 researcher media profiles on six SABC Radio Platforms (Ukhozi FM, Umhlobo Wenene FM, Ligwalagwala FM, Phalaphala FM, Munghana Lonene FM, Radio 2000) and two editions of ScienceScope. These results reflect a solid foundation and strong organisational capacity for impactful science communication.

The CSIR's science engagement and public awareness efforts are organised around four pillars and activities for 2026/27 under each are as follows:

1. YOUTH AND SCHOOL OUTREACH

The CSIR will proactively inspire interest in STEMI among learners through outreach programmes, career awareness activities and interactions with CSIR researchers. Activities will prioritise underserved and rural schools to support national transformation and spatial development objectives.

2. PUBLIC SCIENCE LITERACY

The CSIR will use digital platforms, multimedia content, webinars and media profiling to translate complex research into accessible public narratives. This includes profiling CSIR scientists, especially women and emerging researchers, to humanise science and inspire the next generation.

3. NATIONAL SCIENCE WEEK AND DSTI PRIORITY PLATFORMS

The CSIR will participate in National Science Week and other DSTI-aligned initiatives, showcasing research to diverse public audiences and contributing to the national science communication ecosystem.

4. STRATEGIC PARTNERSHIPS FOR IMPACT

The CSIR will collaborate with universities, science centres and bodies (such as SAASTA), and industry to co-create relatable STEMI content and broaden public reach.

B.4 FINANCIAL PLAN

The CSIR remained on the trajectory of implementing its strategy, geared to deliver on the mandate and specifically, to support industrialisation. However, while headline real GDP has broadly recovered to pre-Covid-19 levels, the overall economic recovery remains fragile. Per-capita income, employment and investment remain below pre-pandemic levels, and the weak domestic environment has negatively affected the organisation's plans to diversify revenue through increased private sector and international income. The initial target was for each of these income streams to contribute 15% of total revenue by 2023/24. Actual contributions, however, were 7% and 10% by the end of 2024/25. Despite not fully meeting this goal, significant progress has been achieved. Over the past six years, private-sector income has grown by 40% and international income by 175%, while total income increased by 28% — even as the PG declined by 10%. Diversification remains critical to reducing the financial risk associated with over-reliance on public sector allocations, particularly given the constrained fiscal environment. This priority will continue to guide the organisation's financial strategy, supported by the implementation of the commercialisation strategy, which seeks to realise greater value from the CSIR's IP and technology development efforts.

Several risks were considered in the development of the 2026/27 financial plan. The fiscal risks within South Africa are largely unchanged since the 2025/26 budget. South Africa's economic recovery remains slow, with modest growth projections of 1.3% in 2026. Despite some stabilisation in electricity supply, systemic weaknesses persist. Chronic issues with power failures, which, when they occur, increase operational energy costs required to power the back-up equipment, along with logistics bottlenecks (port and rail inefficiencies) and aging infrastructure, significantly inflate the CSIR's input costs. This necessitates significant expenditure on mitigating systems. The government's continued fiscal consolidation efforts to stabilise national debt, which has been forecasted to stabilise at approximately 77.9% of GDP by the end of 2025/26, impose severe limits on the growth of science and innovation funding. Consequently, public sector revenue projections have been aligned to National Treasury's growth targets for 2026/27.

Global conditions remain equally fragile, with global growth expected to remain below 3%. Heightened geopolitical instability — including the protracted Ukraine – Russia conflict, ongoing tensions in the Middle East, and global policy uncertainty following the transition to the new U.S. administration — continues to weigh on capital flows and international funding sentiment. Reflecting these conditions, the budget incorporates a conservative 1% increase in international income for 2026/27.

The CSIR budgets for a reduced net loss of R9.8 million for the 2026/27 financial year, a substantial improvement from the R30.8 million budgeted loss for 2025/26. This reflects a deliberate focus on strengthening financial performance by driving contract income growth and containing expenditure. Considering uncertainty around the recent trend of minimal increases or reductions in the PG over the Medium-Term Expenditure Framework (MTEF) period, the organisation has adopted a conservative approach, budgeting for a profit of R15.89 million in 2027/28 and R23.29 million in 2028/29.

The CSIR is cautiously projecting these modest profits through a concerted focus on increasing contract income and containing operational costs. Conservative balance sheet practices, including diligent working capital and cash flow management, remain crucial to ensuring the organisation can invest in the scientific equipment and infrastructure necessary to achieve its strategic objectives.

All financial resources are managed and invested in alignment with the organisation's mandate.

THE DECLINE IN PARLIAMENTARY GRANT

The PG is allocated to the CSIR under Vote 35: Science and Innovation, as published annually in the Estimates of National Expenditure. Over time, the sustained reduction in PG funding has had significant consequences. It has constrained skills development, infrastructure investment, capability building, technology maturation, ICT modernisation, support capacity, and commercialisation initiatives. This erosion directly undermines the organisation's ability to scale its impact and fulfil its developmental mandate.

Although the preliminary baseline PG allocation for 2026/27 shows a nominal increase of 4.7%, the PG has declined sharply in real terms. Had the PG kept pace with cumulative inflation of 119% between 2010 and 2025, the allocation would have been substantially higher. Instead, the PG increased by only 37% over the same period, resulting in an estimated real shortfall of approximately 81%—equivalent to a gap of roughly R416.2 million relative to the 2024/25 allocation.

This continuing decline is of serious concern. Effective execution of the CSIR's developmental mandate requires stable investment in R&D, which should be regarded as a long-term national investment rather than an expenditure item. Countries that have achieved sustained technological and economic advancement have done so through continuous, strategic investment in R&D. The CSIR therefore believes that reconsideration of the PG baseline is essential. Furthermore, the organisation seeks to strengthen its role as the partner of choice for R&D across state-owned entities, national departments, and municipalities—an objective that requires the support and enabling frameworks of National Treasury.

Adverse macroeconomic conditions—including declining budget allocations to government departments and reduced private sector discretionary spending—have further constrained the CSIR's ability to fund essential R&D and maintain its capability base. While income diversification is crucial, a minimum level of baseline funding is required to sustain core scientific and technical capabilities. At the same time, key input costs such as ICT licences, electricity and insurance have risen sharply, driven by external forces including rand depreciation, climate-related risks and Eskom tariff increases.

The financial uncertainty intensified by the Covid-19 pandemic necessitated aggressive cost-containment measures. While these yielded savings, they also constrained investment in critical infrastructure and support systems, affecting operational effectiveness. Capability development, human capital strengthening and infrastructure renewal remain central to the CSIR strategy, and additional government investment is necessary to enable the organisation to fully support key industrial sectors.

The CSIR plays a vital role in South Africa's economic development by contributing to poverty reduction, job creation and a more capable state. To remain globally competitive, modern and efficient infrastructure is essential. However, much of the organisation's infrastructure is ageing, with several buildings more than 70 years old and subject to Section 34 of the National Heritage Resources Act. These facilities are more costly to maintain, contain outdated or irreplaceable materials, and require specialist restoration. As a result, the CSIR faces a maintenance backlog of over R300 million, expected to grow to R1.5 billion over the next ten years. Any halt in maintenance will exacerbate this backlog, affect compliance, and compromise operational reliability.

Ageing infrastructure also hampers the CSIR's ability to attract and retain young researchers, deliver world-class research outputs, and maintain compliance with municipal, regulatory, accreditation and insurance requirements. Without adequate reinvestment, the organisation risks losing insurance cover for certain facilities, particularly those vulnerable to fire or other hazards. The lack of capital funding has already forced the organisation to rent out more buildings to generate funds for basic maintenance—an approach that brings additional complexity and risk.

Over the past six years, the CSIR has invested in building capabilities in precision agriculture, personalised medical products, digital mining safety, localised drug manufacturing, logistics and biomanufacturing. These areas have shown strong interest from stakeholders but required upfront CSIR investment to mature. Without adequate PG support, the organisation's ability to build future-facing capabilities—such as in pandemic preparedness, disaster response, AI, energy, mining, manufacturing and climate change—will be severely constrained. Increasing the pressure on scientific and technical staff to raise contract income also reduces the time available for developing these strategic capabilities, potentially eroding long-term relevance.

Should further cuts against the PG for the organisation be implemented, the financial plan will have to be revisited.

B.4.1 REVENUE GROWTH

For the 2026/27 financial year, the CSIR has budgeted a 2.8% increase in total operating revenue relative to the 2025/26 forecast (see Table G1). Contract R&D income is projected to grow by 2.3%, while baseline PG funding increases by 4.7% on a comparable basis (2026/27 budget versus the 2025/26 forecast).

Revenue from the South African private sector is expected to grow by 5.0% and international contract income by 1.0%, compared to the 2025/26 forecast. Income from the South African public sector is budgeted to increase by 1.1% over the same period.

All necessary efforts are set to generate maximum possible revenue from the opportunities in the sectors that the CSIR supports.

B.4.2 EXPENDITURE

Total expenditure is budgeted to increase in 2026/27 by 2.1% relative to the 2025/26 forecast, remaining below revenue growth. Employee remuneration is expected to remain stable, while operating expenses are anticipated to rise by 5.5%. Depreciation is budgeted to grow by 2.1%, primarily due to the investment in critical R&D and facility assets.

Employee-related costs are projected to remain broadly in line with the 2025/26 forecast, reflecting the cost-containment benefits achieved through budgeted vacancies not filled and the recent organisational repositioning. While cost increases have been contained, the budget still makes provision for essential human capital priorities, including annual cost-of-living adjustments, critical skills development, and the capacity needed to support expected contract income growth. All future recruitment will be strictly dependent on the securing of external contract income, supported by rigorous resource planning to ensure that only strategically critical positions are filled to enable effective delivery against the CSIR's mandate.

The budget for operating expenses is determined by considering contract-specific expenses (directly associated with contract income) as well as operational and functional indirect costs (inherent in running the business).

The CSIR continues to enforce cost containment measures that have been implemented across the organisation.

B.4.3 ROYALTY INCOME

Royalty income is budgeted at R2.1 million and is based on current registered licence agreements and is expected to increase by 3.8% against the 2025/26 forecast.

B.4.4 FINANCIAL SUSTAINABILITY

The CSIR is budgeting for a net loss of R9.8 million for the 2026/27 FY.

Considering uncertainty around the recent trend of minimal increases or reductions in the PG over the MTEF period, the organisation has adopted a conservative approach, budgeting for a profit of R15.89 million in 2027/28 and R23.29 million in 2028/29, subject to the preliminary PG allocations not reducing.

Table G1 in Appendix G. provides the high-level CSIR statement of comprehensive income reflecting the forecast for 2025/26, the budget for 2026/27 and estimates for 2027/28 as well as 2028/29. A summary of PG income for the MTEF period is provided in Table G7 in Appendix G.

B.4.5 STATEMENT OF FINANCIAL POSITION

A CSIR statement of the financial position for the MTEF period is provided in Table G2 in Appendix G.

One needs to consider the budgeted current assets of R1.82 billion, cash balance of R1.1 billion in conjunction with the current liabilities of R1.40 billion. The current ratio (current assets/current liabilities) remains stable at 1.30.

B.4.6 INVESTMENT IN PROPERTY, PLANT AND EQUIPMENT

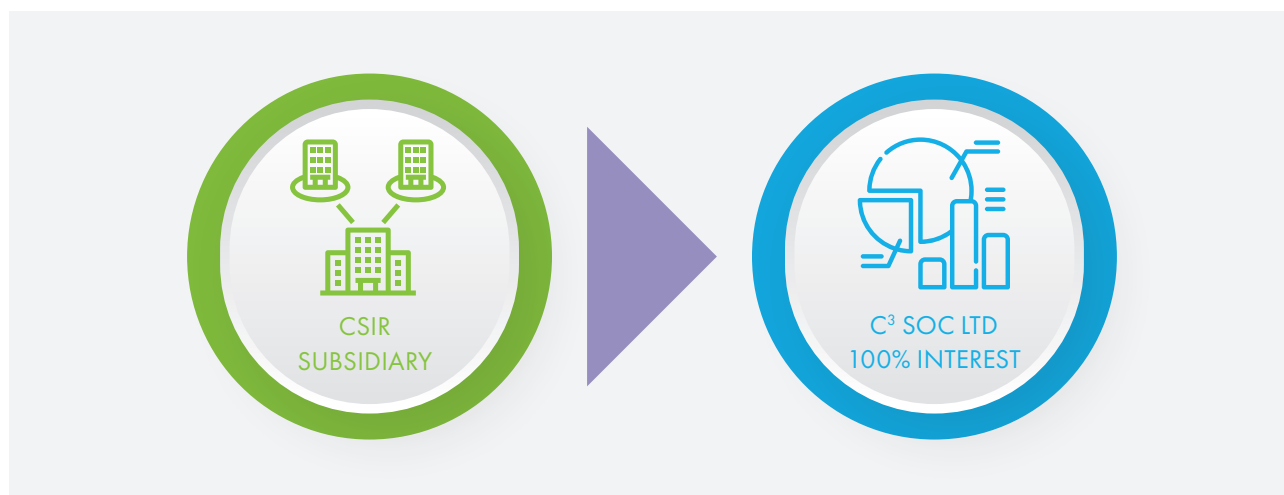
The budgeted investment in PPE for the 2026/27 financial year is R 170 million (Table G5). This includes grant assets of R18.8 million. As previously mentioned, the decline in PG has a significant impact on the organisation's capacity to invest in world class equipment.

Notwithstanding the fact that an item is included in the PPE budget, the investment remains subject to approval as per the Approval Framework of the CSIR and additional considerations such as strategic alignment, return on investment and available cash flow.

B.4.7 CSIR SUBSIDIARY AND AUTHORITY TO ISSUE GUARANTEE INSTRUMENTS

As depicted in the diagram below, the CSIR has only one wholly owned subsidiary (CSIR C³ SOC LTD, previously known as Technifin SOC Ltd) which is an insignificant portion of the total Group budget to date.

Figure B1: CSIR Subsidiary



In October 2023, the CSIR C³ subsidiary was launched as a stand-alone special purpose technology commercialisation vehicle to commercialise and industrialise technologies and the IP that the organisation generates. The enterprise is a 100% owned CSIR company that holds, trades and commercialises CSIR-developed technology. It is a dedicated capability to commercialise CSIR technologies at pace and scale, acting as an accelerator to licence and help incubate high-tech start-ups developed from CSIR IP.

The CSIR has obtained National Treasury approval to issue guarantee instruments not exceeding the above set limits. This approval is set to expire on 31 March 2027. The approval was granted under the following conditions:

- The CSIR to submit quarterly reports to National Treasury on utilisation of the annual limit.
- The CSIR's liquid assets may not fall below R1.47 billion while the approval is in effect; and
- The CSIR is to report disputes and/or contraventions related to contracts for which an authorised guarantee is attached.

The Board approved limits are provided in Table G8 in Appendix G.

B.5 ANNUAL AND QUARTERLY TARGETS 2026/27

Table B11: Phased quarterly KPI targets for 2026/27

KPI	Q1 2026/27	Q2 2026/27	Q3 2026/27	Q4 2026/27
SO1: Conduct RD&I of transformative technologies and accelerate their diffusion.				
KPI 01: Publication equivalents	56	129	227	356
KPI 02: New priority patent applications filed	0	0	2	6
KPI 03: New patents granted	0	0	1	11
KPI 04: New technology demonstrators	1	12	28	68
KPI 05: Number of technology licence agreements signed	0	2	3	14
SO2: Improve the competitiveness of high-impact industries to support South Africa's re-industrialisation.				
KPI 06: Number of localised technologies	2	5	13	21
KPI 07: Number of joint technology development agreements being implemented for industry	3	9	18	38
KPI 08: Number of SMMEs supported	19	42	67	109
SO3: Drive the socioeconomic transformation through RD&I, which supports the development of a capable state.				
KPI 09: Number of reports contributing to national policy development	3	6	8	24
KPI 10: Number of standards delivered or contributed to support the state	0	1	3	11
KPI 11: Number of projects implemented to increase the capability of the state	14	48	79	134
SO4: Build and transform HC and infrastructure.				
KPI 12: Total SET staff	1527	1536	1604	1642
KPI 13: Percentage of SET staff who are black	68%	69%	70%	72%
KPI 14: Percentage of SET staff who are female	38%	38%	39%	40%
KPI 15: Percentage of SET staff with PhDs	17%	18%	18%	19%
KPI 16: Total Chief Researchers	19	19	19	20
KPI 17: Percentage of chief researchers who are black	26%	26%	26%	30%
KPI 18: Percentage of chief researchers who are female	26%	26%	25%	25%
KPI 19: Total principal researchers	170	172	172	175
KPI 20: Percentage of principal researchers who are black	38%	38%	38%	40%
KPI 21: Percentage of principal researchers who are female	23%	23%	24%	25%
KPI 22: Number of staff involved in exchange programmes with industry	23	24	27	34
KPI 23: PPE investment (Rm)	37	108	134	170

KPI	Q1 2026/27	Q2 2026/27	Q3 2026/27	Q4 2026/27
SO5: Diversify income, maintain financial sustainability and good governance				
KPI 24: Total income (Rm)	731	1550	2354	3299
KPI 25: Net profit/(loss) (Rm)	(64)	(52)	(68)	(9.8)
KPI 26: South African public sector income (% total income)	56%	57%	57%	58%
KPI 27: South African private sector income (% total income)	8%	8%	8%	8%
KPI 28: International contract income (% total income)	11%	11%	11%	11%
KPI 29: B-BBEE rating	1	1	1	1
KPI 30: Recordable incident rate	≤0.2	≤0.2	≤0.2	≤0.2
KPI 31: Audit opinion	N/A	N/A	N/A	Unqualified audit opinion



GOVERNANCE STRUCTURES

C.1 CSIR BOARD AND COMMITTEES

The Executive Authority of the CSIR is the Minister of Higher Education, Science and Innovation. The Accounting Authority of the CSIR is the CSIR Board, duly appointed by the Minister. The Practice Note issued by NT dealing with the Submission of Corporate Plans requires the inclusion of the following in the Corporate Plan: The Executive Authority of the CSIR is the Minister of Higher Education, Science and Innovation. The Accounting Authority of the CSIR is the CSIR Board, duly appointed by the Minister. The Practice Note issued by NT dealing with the Submission of Corporate Plans requires the inclusion of the following in the Corporate Plan:

- The composition of the CSIR Board and its subcommittees; and
- The members of the Executive Management team.

C.1.1 CSIR BOARD

The members of the CSIR Board are:

- Vuyani Jarana (Chairperson)
- Prof. Arnold van Zyl
- Dr Thulani Dlamini (CEO)
- Jules Newton
- Vuyo Mthethwa
- Mahesh Fakir
- Dr Christine Render
- Prof. Yunus Ballim
- Maleke Matolong
- Mike Mulcahy
- Michelle Govender

The CSIR Board has three sub-committees, namely, Research, Development and Industrialisation Committee, Audit and Risk Committee and Human Resources and Social & Ethics Committee. The members of these committees are as follows:

RESEARCH, DEVELOPMENT, AND INDUSTRIALISATION COMMITTEE

- Prof. Arnold van Zyl (Chairperson)
- Dr Christine Render
- Prof Yunus Ballim
- Mahesh Fakir
- Jules Newton
- Michelle Govender

AUDIT AND RISK MANAGEMENT COMMITTEE

- Mike Mulcahy (Chairperson)
- Maleke Matolong
- Prof. Arnold van Zyl
- Michelle Govender

HR AND REMUNERATION COMMITTEE

- Dr Vuyo Mthethwa (Chairperson)
- Jules Newton
- Prof Yunus Ballim
- Prof. Arnold van Zyl

Additional details on each Board member are provided in Table C1 below.

Table C1: Details of CSIR Board members

Age	Gender	Race	Qualifications	Date appointed	Position(s) on other Boards
Vuyani Jarana (Chairperson)					
54	Male	Black	University of Stellenbosch: -Masters (Business administration) -Honours (Business Administration) University of Transkei (Walter Sisulu University): -Bcom Economics Business Commercial Law University of South Africa (UNISA): -Advanced Executive Programme Olifantsfontein College: -Diploma (Telecommunications Institution)	January 2023	Non-Executive Director: -Eastern Cape Develop Corporation -Teconica Telecommunications -Cricket South Africa Executive Director: -Ilitha Telecommunications -Ilitha Infrastructure Pty Ltd -Jarana Investment Holdings Council Member: Walter Sisulu University Related party company (Spouse) JBV Consulting Agency
Dr Thulani Dlamini (CEO)					
55	Male	Black	University of the Witwatersrand: -PhD (Chemistry, Catalysis) -BSc Honours (Chemistry) -BSc (Chemistry) University of South Africa: -Masters (Business Leadership)	February 2017	Council Member: National Advisory Council on Innovation Board Member: -Industry Advisory Board of the Faculty of Engineering and Built Environment: University of the Witwatersrand -CSIR C ³ (Chairperson) Director Stellar Ventures
Prof. Arnold van Zyl					
66	Male	White	University of Cape Town: -PhD (Engineering) -MSc (Engineering) -BSc (Engineering)	January 2023	None
Prof. Yunus Ballim					
68	Male	Indian	University of the Witwatersrand: -PhD (Engineering) -MSc (Engineering) -BSc (Civil Engineering)	January 2023	Trustee Chair: Gallagher Foundation Trust Council Trustee: Umalusi

Age	Gender	Race	Qualifications	Date appointed	Position(s) on other Boards
Dr Christine Render					
68	Female	White	Leeds University (England): -PhD (Chemical Engineering) -BSc Honours (Chemical Engineering)	January 2019	Partner: Owner Team Consultation Pty (Ltd)
Dr Vuyo Mthethwa					
57	Female	Black	University of KwaZulu-Natal: -PhD (Student Governance) -MSocSci (Industrial and Labour Studies) -BSocSci Honours -BSocSci (Bachelor of Social Science) Stellenbosch University: -Certificate Programme in Labour Dispute Resolution Practice <i>Cum Laude</i>	January 2019	Deputy Vice-Chancellor: People and Operations Durban University of Technology
Mahesh Fakir					
64	Male	Indian	University of London: -MSc (Development Finance) University of Durban – Westville: -Masters (Business Administration) -MSc (Civil Engineering) University of Natal: -PGDip (Civil Engineering) -BSc (Civil Engineering) ML Sultan Technikon: -National Diploma (Electrical Engineering) Professional Registration: Engineering Council of South Africa (ECSA) - Registered Professional Engineer	January 2023	Non-Executive Director: Chairperson: South African Maritime Safety Authority (SAMSA) Employee: Technical Expert - National Treasury
Jules Newton					
57	Female	White	University of the Witwatersrand: BA (Education)	January 2023	Non-Executive Director: Inhlabathi Pty (Ltd) Trustee: Jeppe Trust Executive Director, Shareholder: Newton van Rensburg Properties

Age	Gender	Race	Qualifications	Date appointed	Position(s) on other Boards
Maleke Matolong					
47	Male	Black	<p>University of Northwest: -Masters (Business Administration) -BCom Accounting</p> <p>University of South Africa: -Short learning programme in Project Management -Programme in Entrepreneur and Small Business Management</p> <p>Professional Registrations: -Southern African Institute of Business Accountant (SAIBA) BAP (SA) -The Chartered Institute of Government Finance, Audit and Risk Officers (CIGFARO) - Associate member</p>	January 2023	Rustenburg Municipality: Audit Performance Committee (APC)
Mike Mulcahy					
42	Male	White	<p>University of Cape Town Graduate School of Business: -MPhil (Development Finance)</p> <p>University of Cape Town: BBusSci (Economics)</p>	July 2023	<p>Non-Executive Director The International Cleantech Network (Chair)</p> <p>Executive Director -The Green Cape Sector Development Agency -K2024072063 (SA) NPC - Neighbourhood Security NPO</p>
Michelle Govender					
38	Female	Indian	<p>University of KwaZulu Natal: -BSc (Electrical Engineering)</p> <p>University of South Africa: PGDip (Applied Risk Management)</p> <p>Professional Certifications: Engineering Council of South Africa -Professional Engineer</p> <p>Gordon Institute of Business (GIBS) Leaders of Entrepreneurship Networks</p>	January 2023	Managing Director and Chief Executive Officer Octarity Pty (Ltd)

C.1.2 EXECUTIVE MANAGEMENT

To ensure streamlined decision making with a single point of accountability, and to address the multiple efficiency challenges of aligning strategy and operations, alongside the need to align strategic partnerships with the investment strategy, innovation strategy and operations, the CSIR Executive portfolios have been consolidated and are structured as follows:

- CEO – Dr Thulani Dlamini
- Finance – CFO: Esteé Opperman
- Business Excellence and Integration – Group Executive: Dr Kaven Naidoo
- Advanced Chemicals and Life Sciences – Divisional Group Executive: Dr Rachel Chikwamba
- Advanced Production and Security – Divisional Group Executive: Dr Motodi Maserumule
- Smart Society – Divisional Group Executive: Dr Sandile Malinga
- Human Capital and Strategic Communications – Group Executive: Andile Mabindisa
- Legal Compliance and Business Enablement (LCBE) – Group Executive: Adv. Esmé Kennedy.

Table C2: Details of CSIR Executive Committee Members

Age	Gender	Race	Qualifications	Date appointed	Position(s) on other Boards
Dr Thulani Dlamini (CEO)					
55	Male	Black	University of the Witwatersrand: -PhD (Chemistry, Catalysis) -BSc Honours (Chemistry) -BSc (Chemistry) University of South Africa: -Masters (Business Leadership)	February 2008 - December 2011 February 2017-	Council Member: National Advisory Council on Innovation Board Member: -Industry Advisory Board of the Faculty of Engineering and Built Environment: University of the Witwatersrand -CSIR C ³ (Chairperson) Director Stellar Ventures
Adv. Esmé Kennedy – Group Executive: LCBE					
48	Female	White	North-West University: Potchefstroom Business School: Masters (Business Administration) Potchefstroom University: -LLM (Import and Export Law) -LLB University of Pretoria: B.Proc High Court of South Africa: Admitted as an Advocate General Council Bar of South Africa: Admitted as a member of the Johannesburg Bar	August 2019 -	Non-Executive Director: CSIR C ³ Professional Membership: Institute of Directors in South Africa

Age	Gender	Race	Qualifications	Date appointed	Position(s) on other Boards
Andile Mabindisa – Group Executive: Human Capital and Strategic Communications					
55	Male	Black	University of Natal: -PGDip (Industrial Relations) -BSocSci Honours -BSocSci (Bachelor of Social Sciences)	April 2019 -	None
Dr Motodi Maserumule – Divisional Group Executive: Advanced Production and Security					
58	Male	Black	Rensselaer Polytechnic Institute (USA): PhD (Mathematics) Clark Atlanta University: MSc (Mathematics. Applied) IMD, Lausanne, Switzerland: Mastering Technology Enterprise Morris Brown College: BSc (Mathematics) SA National Defence College: Executive National Security Programme	April 2019 -	Director: -Akubra Trading -Mogoma Le Tihako Group -Dimo wa Bauba -Blue Waves Pty Ltd and Akubra Trading Professional Membership: -Institute of Directors in South Africa. -Society of Industrial and Applied Mathematics
Esteé Opperman – CSIR CFO					
44	Female	White	University of Pretoria -BCom Honours (Accounting Science) -BCom (Accounting Science) -Cert (Accounting Science) Chartered Accountant: South African Institute of Chartered Accountants (SAICA)	January 2023 -	Trustee: CSIR Pension Fund (Chairperson) Non-Executive Director: CSIR C ³
Dr Kaven Naidoo – Group Executive: Business Excellence and Integration					
48	Male	Indian	University of the Witwatersrand: -PhD (Aeronautical Engineering) -BSc (Aeronautical Engineering) University of Pretoria BEng Honours (Mechanical Engineering) South African National Defence College: Executive National Security Programme	January 2022 -	Director: -The Impact Catalyst -Students for the Exploration and Development of Space South Africa NPC. -Enterprise K2020192513 (STEM Education) -Iliani Education Group

Age	Gender	Race	Qualifications	Date appointed	Position(s) on other Boards
Dr Rachel Chikwamba – Divisional Group Executive: Advanced Chemicals and Life Sciences					
58	Female	Black	<p>Iowa State University: PhD (Genetics)</p> <p>University of Queensland: MSc (Agricultural studies)</p> <p>Gordon Institute of Business Science: Masters (Business Administration)</p>	November 2011 -	<p>Advisory Council Member: Australian Center for International Agricultural Research</p> <p>Non-executive Director: Wits Health Consortium (Pty) Ltd</p> <p>Member: -CGIAR Board membership -African Union (AU) high-level committee on Science, Technology and Innovation Strategy for Africa 2024 (STISA 2024)</p>
Dr Sandile Malinga – Divisional Group Executive: Smart Society					
58	Male	Black	<p>Rhodes University: PhD (Physics)</p> <p>The Netherlands Business School: Masters (Business Administration)</p>	August 2022 -	<p>Director: Innoserve</p> <p>Non-executive Director: South African Bureau of Standards (SABS)</p>



RISK MANAGEMENT PLAN

D.1 CSIR RISK MANAGEMENT PLAN

D.1.1 RISK MANAGEMENT PHILOSOPHY

The CSIR maintains a broad view of risk as any event, positive or negative, that could affect its ability to achieve its mandate, mission, vision and SOs.

The CSIR acknowledges that risk, in one form or another, is present in virtually all its endeavours, and that successful risk-taking is necessary to achieve business strategic objectives and goals. Therefore, CSIR does not seek to eliminate all risk but seeks to be risk-aware as opposed to risk-averse, and to effectively manage the uncertainty inherent in its environment as well as pursue diverse opportunities presented by the risks.

The CSIR seeks to identify, understand, assess, and respond to the risks and opportunities faced, considering their impact on the CSIR's resources, reputational standing, compliance requirements, financial position, and performance. Furthermore, the CSIR seeks to pursue prudent risks or opportunities that it believes will generate sufficient and sustainable performance and value, avoid intolerable risks, manage residual risk within defined and desired levels, and be prepared to respond to risks or appropriate opportunities when necessary.

Exco and the Board of Directors, acting through the ARC of the Board, will assess the CSIR risk philosophy on an annual basis, as well as report and implement any recommended and approved changes.

To eliminate uncertainty among employees and stakeholders about the policies and procedures that shape the CSIR's approach to risk management, the CSIR has developed and implemented an RMP. A risk appetite and tolerance guideline aligned with the RMP will continuously be assessed and defined in support of the strategic objectives and operating landscape of the CSIR.

D.1.2 PURPOSE OF THE RMP

The RMP is developed to support the successful implementation and achievement of the overall CSIR strategy and to outline the risk management activities required during the financial year. In addition, it aims to entrench a culture of risk management aligned with the CSIR's EPIC values. The development of the RMP for 2025/26 FY considers the CSIR strategic plan and the annual performance plan. The RMP seeks to identify, analyse, evaluate, monitor and report on key organisational risks, and importantly, to develop and implement risk-response and mitigation strategies to bring associated risks to acceptable levels.

Risk management, as set out in King IV, addresses a much wider spectrum of risk than in the past. In addition, the corporate governance drivers behind risk management today require new ways of reporting and monitoring risk exposures. Therefore, it is important to note that the RMP is an evolving instrument. The contents of the plan reflect the current risk management requirements of the CSIR. The document is reviewed and updated annually by Exco, ARC and the CSIR Board.

When ERM is applied to all aspects of the organisation, it assists the CSIR in making informed choices that:

- Provide assurance that current key and significant risks are known and effectively controlled;
- Improve business performance by enhancing decision-making and planning.
- Promote a more innovative, less risk averse culture in which the taking of calculated risks in pursuit of opportunities to benefit the organisation is encouraged; and
- Provide a sound basis for integrated risk management and internal control as components of good corporate governance.

D.1.3 LEGISLATIVE CONTEXT

The RMP is developed in line with the prescripts of applicable legislation, as amended from time to time, including but not limited to:

- The Public Finance Management Act, 1999 (Act 1 of 1999);
- National Treasury Regulations issued in terms of the PFMA;
- The Scientific Research Council Act, 1988 (Act 46 of 1988);
- Occupational Health and Safety Act, 1993 (Act 85 of 1993); and
- Labour Relations Act, 1995 (Act 66 of 1995).

The RMP also incorporates the requirements of the King IV Report on Corporate Governance, the COSO framework on Integrated Risk Management, as well as ISO 31000 as best practice guidelines and frameworks on risk management. The CSIR is in the process of implementing an ERM technology platform to support much-needed automation and to complement the existing ERM processes, standards and frameworks.

D.1.4 SCOPE OF APPLICATION

The RMP applies to all business activities of the CSIR.

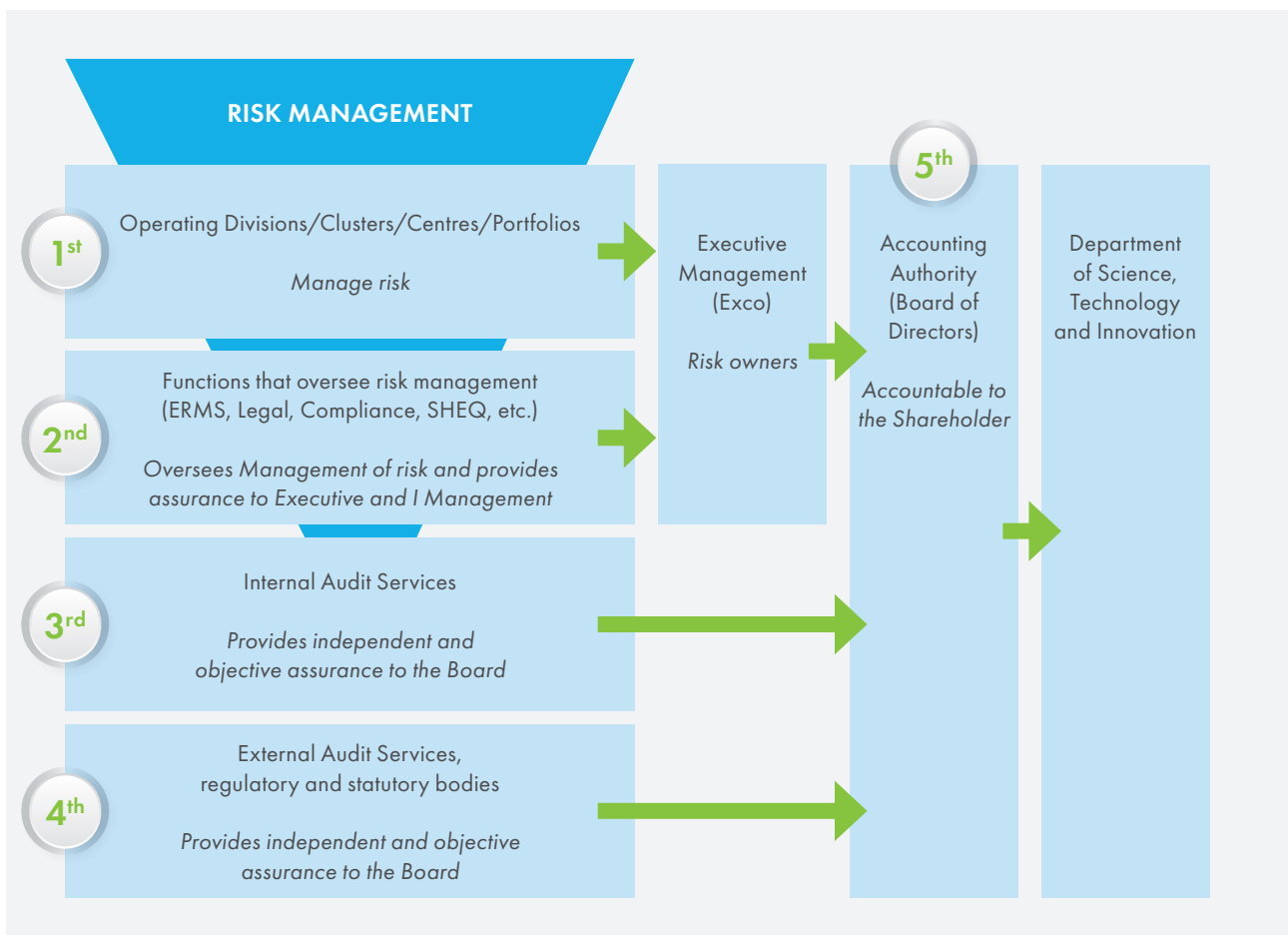
D.2 COMPONENTS OF THE RMP

The CSIR manages risk through a well-defined risk-governance model, commonly referred to as Five Lines of Assurance (defence) Model. Each component of this governance model is defined through several supplementary organisational structures, guidelines, templates and implementation tools that provide clarity and enhancement for stakeholder use and ensure a single approach to enterprise-wide risk management. The governance model comprises the elements outlined below.

D.2.1 RISK GOVERNANCE MODEL AND FRAMEWORK

The CSIR Five Lines of Assurance model is outlined in the diagram below.

Figure D1: CSIR 5 lines of assurance model



Ownership and management of risk lie with those who undertake the operations within the organisation (first line assurance). Business operations are also responsible for implementing and maintaining effective internal controls, executing risk and control procedures, and implementing corrective actions to address process and control deficiencies. They identify, assess, and mitigate risks, guide the development and implementation of internal controls, policies and procedures and ensure that activities are consistent with goals and objectives.

Functions that oversee risk management, (second line assurance) coordinate the management of risk in support of the risk owners (Exco) and line management, who in turn report to the Board of Directors. The latter retains ultimate accountability for organisational risk governance. The Internal Audit function (third line assurance) provides independent assurance directly to the Board of Directors on the adequacy and effectiveness of internal control environment, risk management frameworks, systems, and implementation.

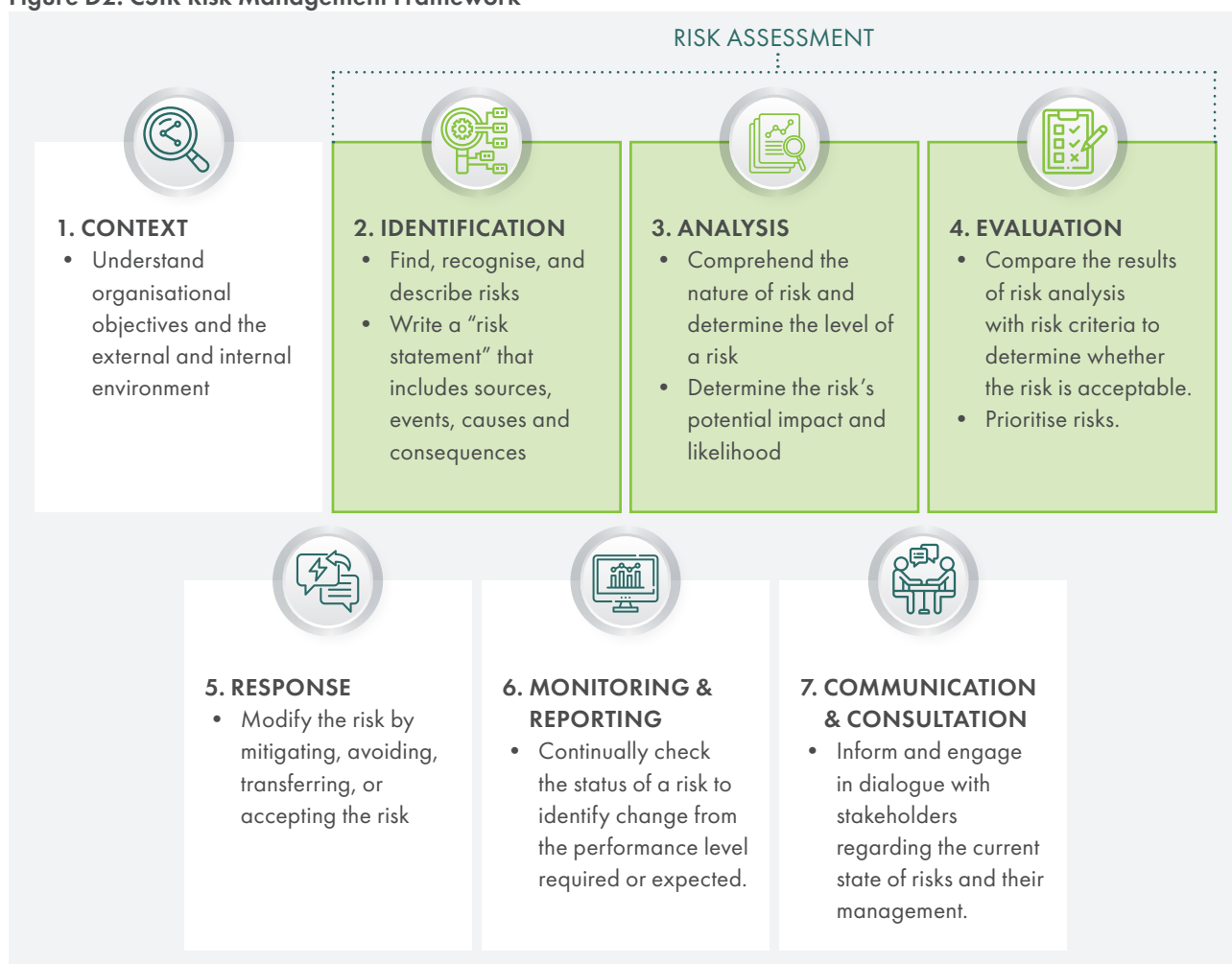
The Five Lines of Assurance model recognises the external audit function as the fourth line assurance providing an independent and objective assurance to the Board of Directors and the shareholder on the CSIR’s financial statements (statutory audit). The Auditor General of South Africa is the statutory body performing this function.

Robust oversight by the Board of Directors and Exco (fifth line assurance), establishes the cornerstone of effective risk management and set the tone from the top. To give effect to their fiduciary responsibilities, the Board of Directors is supported by the ARC. The ARC is an oversight body delegated with the responsibility of implementing effective risk governance and strategy, supported by an appropriate risk management framework that includes adequate control mechanisms to ensure effective risk management. The ARC also reviews the overall effectiveness of the risk management system i.e. policies, frameworks, methodologies, technology system, structures, response strategies, etc.

D.2.2 RISK MANAGEMENT FRAMEWORK OVERVIEW

The main elements of the CSIR’s Risk Management Framework, as per the ISO 31000 standard, are reflected in the Risk Management Process depicted in the illustration below:

Figure D2: CSIR Risk Management Framework

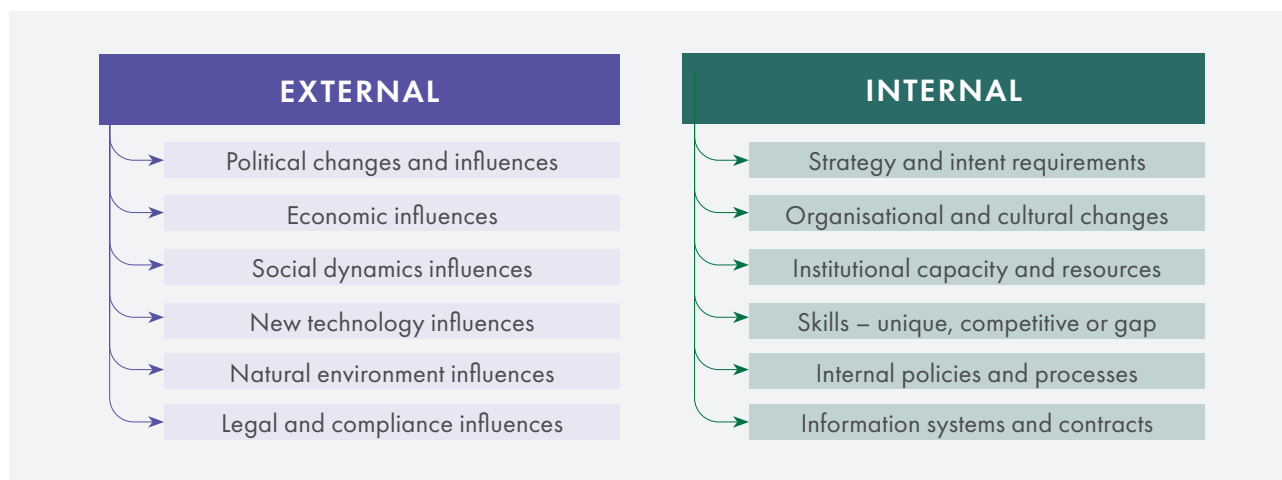


For clarity on the CSIR’s approach, expanded descriptions of some steps of the process are provided in the following sections.

ESTABLISHING THE RISK CONTEXT

Establishing the risk context entails analysis of the CSIR's external and internal operating environment which is considered when managing risk as per the diagram below:

Figure D3: CSIR internal and external context analysis for risk management



To achieve the CSIR's strategic objectives, a thorough analysis of the overall risk environment is conducted periodically to establish a common understanding of the risk universe that needs to be addressed. As this environment remains in flux, the relevant risk universe is continuously reviewed, updated, and agreed upon.

RISK ANALYSIS AND EVALUATION TO DETERMINE PRIORITISATION

The outcomes of the risk identification and classification processes are compiled into multi-level and escalating risk and control registers across the organisation, with major risks reported to the next level, ultimately culminating in the formulation of the CSIR's top risks.

Risk registers are reviewed and updated on a quarterly (as well as ad-hoc) basis with the risk and control owners. After any strategic, policy, mandate or structural change, a risk assessment workshop is conducted to review and update the applicable risk register. Risks in the CSIR have been classified into the following three broad categories:

- Systemic risks - originate from macro-economic and national challenges affecting the National System of Innovation and National Government Business Enterprise space in which the CSIR operates.
- Strategic risks – risks that directly impact on the ability of the CSIR to deliver on its strategic objectives and statutory mandate; and
- Operational risks - include financial, legal and compliance risks and are those risks affecting the systems, people, and processes through which the CSIR operates.

RISK MITIGATION

Risk mitigation entails implementing controls to manage the risk. These control options are:

- Tolerate/accept – accepting the risk by keeping activities unchanged. This option is applied when exposure is tolerable, control is impossible, or the cost of control exceeds potential benefit;
- Treat/reduce – adjusting (adding or revising) relevant activities;
- Transfer – sharing the risk by involving relevant stakeholders. This works well for financial risks, risks to assets and includes securing conventional insurance or sourcing a third party to manage or undertake the risk; and
- Terminate/Avoid – avoiding or cancelling the activities that give rise to the risk after considering the cost/benefit analysis.

MONITORING AND REPORTING

The CSIR's top risks are considered and updated quarterly to address risk movements, emerging risks and should be considered a living document. Furthermore, each risk is monitored by ERMS to verify the implementation of the proposed mitigation strategies and the impact on the internal control environment. ERMS also facilitates the review of risks taking into consideration:

- Changes in the assessment of the risk;
- Changes to risks as driven by the macro environment;
- Suggested changes to the risk mitigation strategy;
- Progress made against the detailed action plans; and
- Any material factors from internal and external environment.

Internal audits and ad hoc risk assessments, either in accordance with the combined assurance plan or due to a perceived risk, will be conducted to monitor and evaluate the extent of compliance with policies, procedures, and proposed controls. The role of the Internal Audit function is to actively monitor the internal and external environment and, if identified risks are not responded to appropriately, to act as a catalyst for ensuring that the risk universe is continually updated.

Furthermore, the CSIR will utilise the Risk, Audit and Compliance Committee (RACC) forum to establish a focused strategy for Risk Management, Compliance and Audit Steering Committee to steer and take responsibility for the CSIR RMP and ensure its effective implementation, in support of combined assurance and ensuring that key risks are managed appropriately. The CSIR will also implement a fit for purpose combined assurance operating model that will help the organisation to effectively address its GRC.

In alignment with King IV, the CSIR Board of Directors will receive assurance regarding the effectiveness of the RMP through the following principles:

- On a quarterly basis, the RACC will provide Exco with progress updates against the combined assurance plan and progress against the implementation of the RMP;
- On a quarterly basis, management will provide assurance to Exco that the RMP is integrated into the daily activities of the CSIR. The CSIR CEO, as part of his quarterly report to the BoD, will provide assurance via the ARC on the status of the risk management system; and
- On an annual basis, the Internal Audit function will provide a written assessment of the effectiveness of the system of internal controls and risk management to the Board of Directors via the ARC.

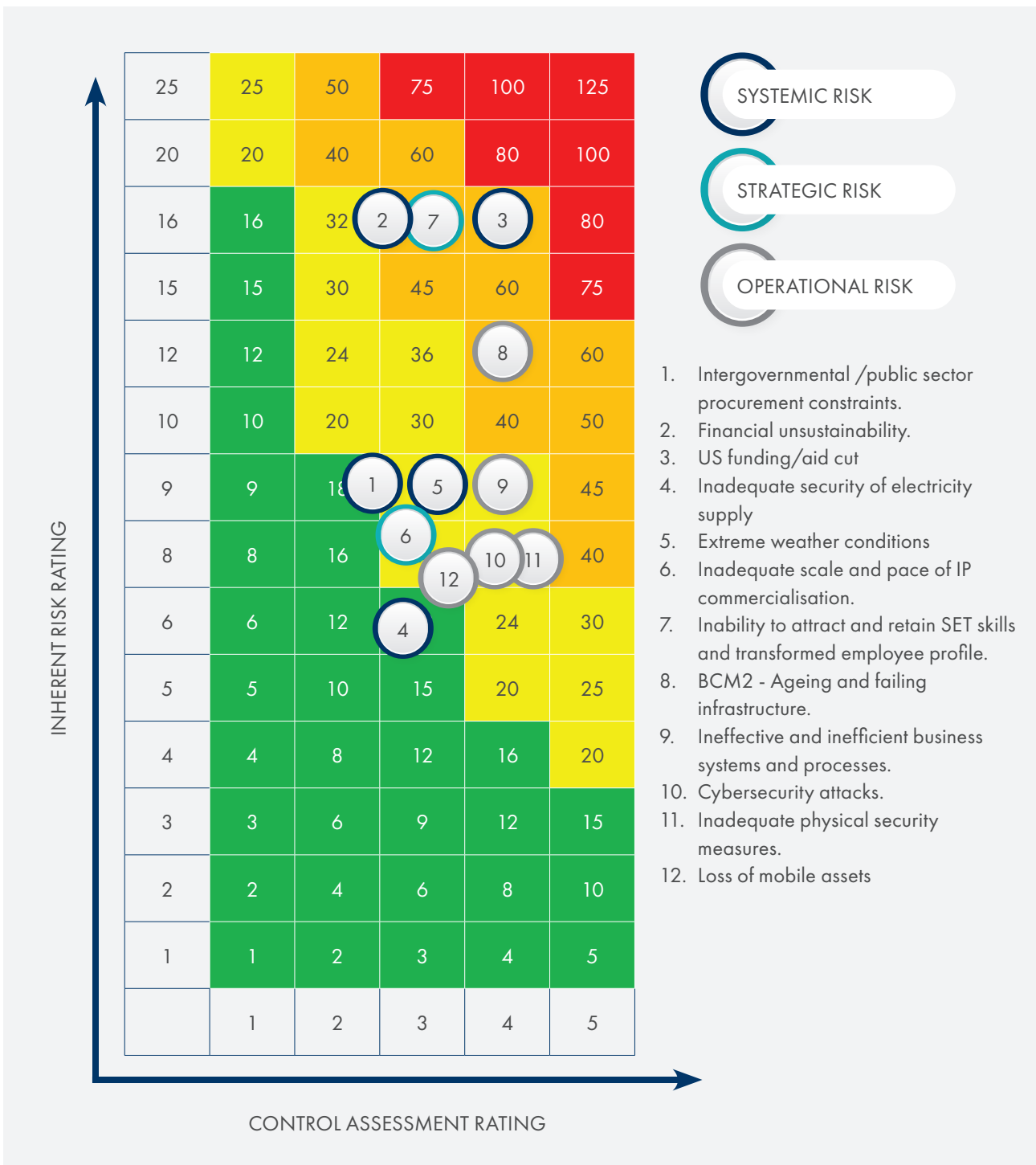
For the Board of Directors to discharge its duty of ensuring effective and continual monitoring of risk management, risk monitoring is an integral part of the CSIR RMP, to provide assurance that measures remain effective.

D.3 CSIR TOP RISK PROFILE

D.3.1 TOP RISK HEAT-MAP

The below risk heat-map identifies the top organisational risks that were identified through the risk identification, analysis and evaluation processes conducted by senior management (top-down) and through operational risk assessments conducted by all business areas (clusters, centres and portfolios). A strategic risk assessment process was conducted during Exco strategy session in July 2024. The purpose of the process was to confirm the risks that Exco deems key to the achievement of the CSIR’s strategic objectives and goals, as well as to develop appropriate risk mitigation actions. The session was also used to identify emerging business risks and to evaluate the effectiveness of the current risk mitigation efforts/controls.

Figure D4: CSIR Top Risk Heat Map



D.3.2 CSIR RISK THEMES

The diagram below provides an overview of organisational risks that were identified, analysed, monitored and reported over the last six financial years since the implementation of the new CSIR strategy in the 2019/20 FY.

Table D1: CDIR Risks managed over a period of time

Residual risk rating:		Low	Medium	High	Critical		
Risk title	Risk trend since the implementation of CSIR strategy 2019/20 FY						
	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26 (Q1)
1. Public sector procurement constrains	✓	✓	✓	✓	✓	✓	✓
2. Financial unsustainability	✓	✓	✓	✓	✓	✓	✓
3. US funding cut to South Africa	Risk was not on the radar during this period					✓	✓
4. Inadequate security of electricity supply	✓	X		✓	✓	✓	✓
5. Extreme weather conditions	Risk was not on the radar during this period					✓	✓
6. Inadequate scale of IP commercialisation	✓	✓	✓	✓	✓	✓	✓
7. Inability to attract and retain key SET skills and transformed employee profile	✓	✓	✓	✓	✓	✓	✓
8. Ageing and failing infrastructure	✓	✓	✓	✓	✓	✓	✓
9. Ineffective and inefficient business systems and processes	✓	✓	✓	✓	✓	✓	✓
10. Cyber-security attacks	✓	✓	✓	✓	✓	✓	✓
11. Inadequate physical security measures	Risk was not on the radar during this period			✓	✓	✓	✓
12. Loss of mobile assets	Risk was not on the radar during this period			✓	✓	✓	✓

The following key risks have since been adequately mitigated and removed from the top risk profile:

- Covid-19 disruption;
- Inadequate security of electricity supply has reduced from medium to low risk due to the reduced levels of load reduction by ESKOM. However, the Scientia campus continues to experience frequent power failure/cut due to external electricity infrastructure incidents/disruptions.
- Negative SHE incidents is a low risk and removed from the top risk register. The risk is however being monitored on a continuous basis and will be flagged if or when incidents occur. The organisation has achieved its RIR target at the end of the 2024/25 FY.
- The risk on the security of national water supply reduced from medium to low risk due to improved supply of water across the country. The risk was removed from the top risk register as at the end of Q4 due to the operations not being impacted. The CSIR has adequate mitigation controls to manage sporadic water cuts, especially in the Gauteng sites.

The CSIR is actively monitoring and proactively implementing appropriate internal control measures to mitigate against the following emerging risks:

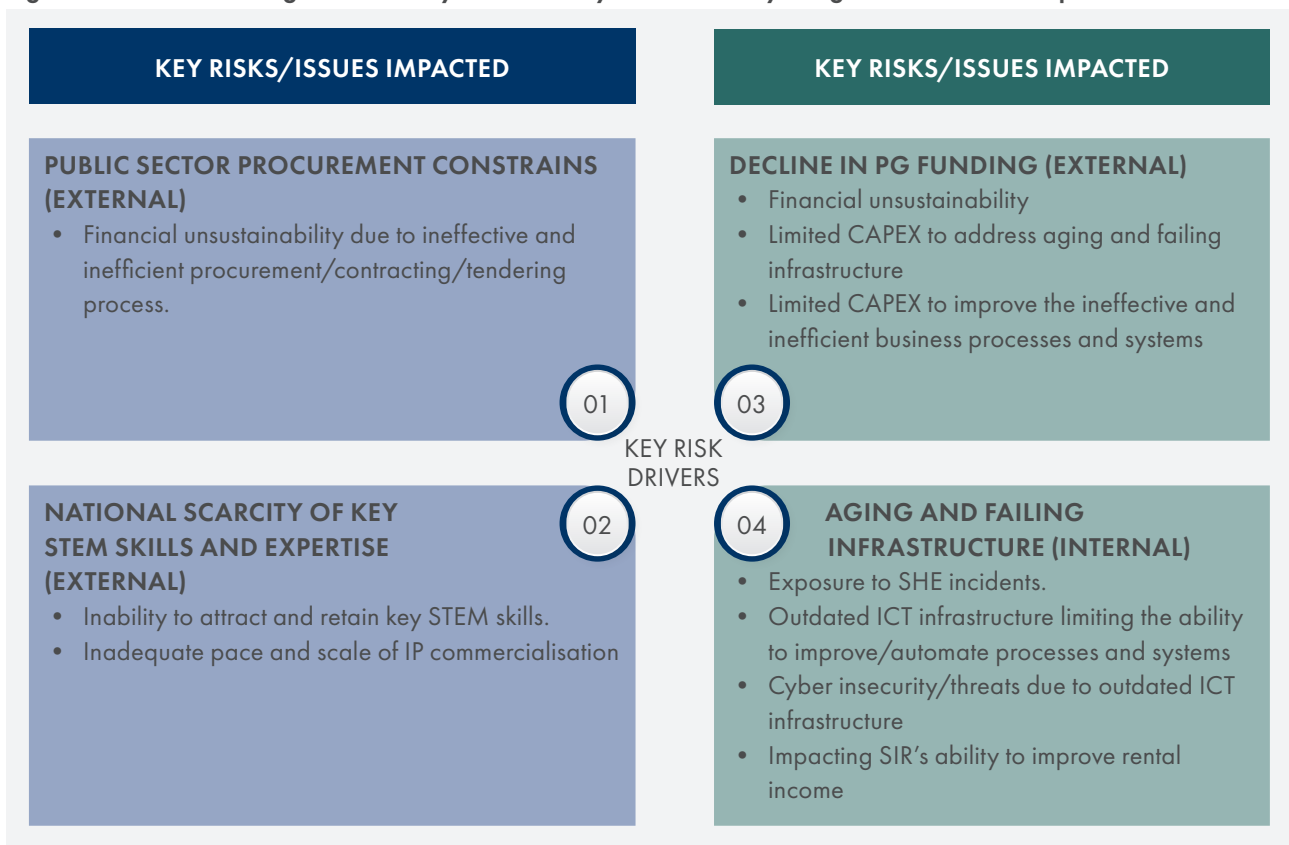
- Irregular, fruitless and wasteful expenditure;
- Potential misuse/uncontrolled use of AI tools in RD&I and operational activities;
- Extreme weather conditions that may impact infrastructure, field projects and other operational activities.

D.3.3 KEY RISK DRIVERS

A risk driver is anything that influences the nature of a risk. Risk drivers can be positive or negative, and internal or external. One risk driver can influence more than one risk, and/or multiple risk drivers can influence one risk. Examples of risk drivers are economic conditions, regulatory changes, technological advancements, human factors, operational processes, and environmental conditions. The speed and effective implementation of key risk mitigation actions on the risk drivers will drive the successful mitigation of other risks as depicted in the diagram below and therefore leading to the achievement of one or more strategic objectives and goals.

The below diagram provides an overview of top risk drivers and issues affecting the CSIR’s ability to effectively and efficiently mitigate its risks to acceptable level(s). Management is concerned about the pace and progress at which key remedial actions are being implemented to drive an overall effective risk mitigation process.

Figure D5: Risks affecting CSIR’s ability to effectively and efficiently mitigate its risks to acceptable levels



D.3.4 CONCLUSION

The CSIR proposes a proactive approach towards risk management and will continue to take the necessary measures to improve its ERM practices.



FRAUD PREVENTION PLAN

E.1 INTRODUCTION

The CSIR's FPP was developed in compliance with section 3.2.1 of the Treasury Regulations of the PMFA. The CSIR subscribes to the principles of good corporate governance, which require business to be conducted in an honest, ethical, and transparent manner. Consequently, the CSIR is committed to preventing and eradicating fraudulent behaviour at all levels within the organisation.

This FPP is premised on the CSIR Fraud Prevention and Management Policy ("FPMP") and the CSIR's core ethical values drive the business of the CSIR, the development of its systems, policies and procedures, interactions with upstream and downstream stakeholders in its value chain and overall value proposition, including public and private sector customers, members of the public at large, suppliers and service providers, employees, and its shareholder.

In alignment with the CSIR's core organisational EPIC values, this FPP is the cornerstone in promoting ethical conduct and determining how incidents or suspected incidents of fraud and corruption will be prevented, detected, and investigated.

The CSIR has zero tolerance and appetite for fraud and corruption. The organisation established a whistleblowing (i.e., protected disclosures) facility to support the efforts of this FPP. This facility is operated by an independent service provider on a 24 hours, seven days basis.

The Legal and Compliance portfolio, as part of its strategic business plan, working with the CSIR's Communications function, will continue to provide extensive awareness and training on the CSIR's FPMP and the Ethics Statement and Code of Conduct to all CSIR employees and other stakeholders. This portfolio has also been creating awareness on the existence, purpose, and use of the whistle blower hotline. A comprehensive process of establishing a combined assurance model with other key role-players in the business to drive an adequate and effective Governance Risk Compliance (GRC) management capability was developed and came into effect in 2024/25 FY as part of the broader CSIR governance controls. The Risk, Audit and Compliance Committee will also oversee the management of fraud and corruption matters within the CSIR and make recommendations on control corrections and improvements.

The FPP is a dynamic plan and will continuously evolve as the CSIR strives to continue promoting ethics and preventing fraud.

E.1.1 PURPOSE OF THE FPP

The purpose of the CSIR FPP is to establish an approach in dealing with fraud risk as mapped out in the Fraud and Corruption Risk Register. It recognises the basic fraud prevention initiatives within the CSIR, and identifies the custodians responsible for the creation of awareness, enforcement and investigation of incidents or suspected incidents of fraud and corruption. The primary objectives of the CSIR FPP are to:

- Provide guidelines in creating awareness of, preventing, detecting, and reporting fraudulent activities within the CSIR;
- Create and encourage a culture within the CSIR in which all stakeholders continuously behave ethically in their dealings with, or on behalf of the CSIR;
- Improve the application of applicable systems and compliance with applicable policies, procedures, and regulations;
- Encourage all employees and stakeholders to strive towards the prevention and detection of fraud impacting or with the potential to impact the CSIR;
- Encourage all employees and stakeholders to report suspicions of fraudulent activity without fear of reprisals or recriminations; and
- Provide a governance framework within which the initiatives that support the creation of awareness, enforcement and investigation of incidents, or suspected incidents of fraud and corruption, are implemented and overseen.

E.1.2 LEGISLATIVE CONTEXT

The FPP was developed with the aim of giving effect to the requirements and stipulations of the following legislations, among others, as amended from time to time:

- The Constitution of the Republic of South Africa, 1996;
- The Public Finance Management Act, 1999 (Act 1 of 1999);
- Treasury Regulations issued in terms of the PFMA in April 2001;
- The Scientific Research Council Act;
- The Protected Disclosures Act, 2000 (Act 26 of 2000);
- The Prevention of Organised Crime Act, 1998 (Act 121 of 1998);
- The Prevention and Combatting of Corrupt Activities Act, 2004 (Act 12 of 2004); and
- All mandatory policies adopted by the Board of the CSIR contextualising legislative and related compliance requirements.

E.1.3 SCOPE OF APPLICATION

The FPP applies to all corruption, fraud, theft, financial misconduct and maladministration or suspected irregularities of such nature involving the following persons or entities:

- All members of the CSIR Board;
- All employees of the CSIR;
- Consultants, suppliers, contractors, collaborators, and sponsors and other providers of goods or services to the CSIR; and
- All parties representing the CSIR and its business activities in an official capacity.

E.1.4 POLICY STANCE

The policy of the CSIR is one of zero tolerance to fraud and corruption. All alleged cases of fraud and corruption will be investigated and followed up by applying all remedies available to the full extent of the law. These measures include existing financial and related controls, the implementation of appropriate prevention and detection measures and verification mechanisms as prescribed in the systems, policies, and procedures of the CSIR.

The CSIR seeks and intends to facilitate a culture of voluntary disclosure of information relating to suspected fraud and related misconduct by employees in a responsible manner. Employees and stakeholders are encouraged to report suspicions of fraudulent activity without fear of reprisals or recriminations.

The efficient application of instructions and guidance contained in the regulations, policies and procedures of the CSIR is one of the most important duties of every employee in the execution of his/her daily tasks.

The policy stance is currently encapsulated in the FPMP and various CSIR policies and procedures, including, but not limited to, the CSIR Code, CSIR Conditions of Service, CSIR Disciplinary Code and Procedure, CSIR ICT Policy, Information Security Policy, Conduct of Research Policy and CSIR Ethics Hotline Procedure.

To support and enforce this policy stance, the Compliance function within the Legal and Compliance portfolio encompasses specialist roles in Senior Compliance Specialist, Compliance Specialist, and Governance and Company Secretariat reporting to Manager: Compliance.

The Compliance function serves a management role primarily focused on devising, implementing, and overseeing organisational processes to meet its statutory and regulatory obligations. Its objective is to integrate legal analysis, design and implement appropriate controls and form part of the Combined Assurance Plan of the organisation. Compliance services focus on educating the Board, senior management, and other employees, as well as preventing and rooting out misconduct, whether legal, ethical, criminal or otherwise. The Compliance function serves as the dedicated custodian of fraud prevention, fraud risk management and the process adopted by the CSIR in putting mechanisms in place to manage the CSIR's vulnerability to fraud. These mechanisms are designed to prevent, deter, and detect fraud.

E.2 COMPONENTS OF THE FPP

E.2.1 GUIDING PRINCIPLES

The FPP of the CSIR is based on the CSIR's EPIC values of pursuit of excellence, being people-centred, personifying integrity and embracing collaboration. The FPP places emphasis on Integrity. This principle is founded on honesty in business and other dealings, creating a culture of openness and disclosure, promoting the eradication of criminal, unethical and other irregular conduct and adopting a zero-tolerance approach towards fraud and corrupt activities. This applies to all allegations, attempts and incidents of fraud that have an impact on or the potential to impact the CSIR. All CSIR employees, management and other stakeholders must comply with the spirit and content of the FPP. A person who holds a position of authority as stipulated in section 34 of the Prevention and Combatting of Corrupt Activities Act, should report any suspected corrupt activity and/or an offence of theft/fraud to the police.

E.2.2 COMPONENTS

The CSIR's FPP encompasses controls that have three SOs:

- Prevent instances of fraud and corruption from occurring;
- Detect instances of fraud and corruption when they do occur; and
- Respond appropriately and take corrective action when fraud and corruption happen.
- The FPP provides the CSIR with tools to manage fraud and corruption risk and has four phases:
- Assessment of organisational needs, based upon the nature of fraud and corruption risks identified in our Fraud Risk Register and existing control environment;
- Design of programmes and controls in a manner that is consistent with legal and regulatory requirements, as well as best practices;
- Implementation of programmes and controls through the assignment of roles, building of internal competencies, training, and deployment of resources; and
- Evaluation of programme and control design, implementation, and operational effectiveness.

Fraud prevention is a business imperative, and a shared responsibility between management and employees. The FPP forms part of the Shareholder's Compact that is approved by the CSIR Board annually. The components of the FPP are as follows:

- The CSIR's core organisational EPIC values;
- The Code;
- CSIR systems, policies, procedures, rules, and regulations;
- The CSIR Disciplinary Code and Procedure;
- Internal controls to prevent and detect fraud;
- Physical and information security management;
- Internal Audit function;
- Ongoing risk assessments;
- Reporting and monitoring of fraud allegations;
- Creation of fraud and corruption awareness among employees and relevant stakeholders through communication and education;
- Continued establishment and maintenance of a combined assurance committee to steer and take responsibility for the FPP and its effective implementation; and
- Ongoing review of the FPP.

The key deliverables of the FPP are to raise awareness about potential fraud and corruption, and to put fraud prevention and response strategies in place. In addition to the generic risks and mitigation strategies identified below, the CSIR has developed and maintains a CSIR Fraud Risk Register as a sub-set of the overall organisational Risk Register. The Fraud Risk Register is a key outcome of the risk identification and assessment process and includes all key risks that require a mitigating response. The CSIR will be undertaking a review of the CSIR Fraud Risk Register in FY 2025/26 to ensure alignment with the risk trends observed over time within the CSIR.

E.3 APPROACH TO FRAUD PREVENTION

E.3.1 PREVENTING FRAUD

Fraud prevention strategies are the first line of defence and provide the most cost-effective method of controlling fraud within the CSIR. To be effective, fraud prevention requires a number of contributory elements, including an ethical organisational culture, a strong awareness of fraud among stakeholders and an effective internal control framework.

E.3.2 THE CODE

The Code establishes clear guidelines for contracted and non-contracted stakeholders of the CSIR regarding the standard of conduct required in their internal and external dealings for and on behalf of the CSIR. The generic risks identified by the CSIR in the application of the Code, are as follows:

- Lack of buy-in or compliance with the requirements of the Code by management, employees or official CSIR representatives;
- Lack of awareness and/or inadequate communication and training strategy relating to the Code;
- Employees with low integrity and/or standards of professional conduct seeking to enhance personal benefit; and
- Strict compliance with and acceptance of gifts and strong disclosure elements.

Strict compliance with the Code by employees and CSIR representatives, both in its spirit and content, addresses the aforementioned risks. However, recognising that striving to achieve such a status and culture of compliance in totality is idealistic, the CSIR will pursue the following tactics to improve the professional ethics and conduct of its employees and representatives:

- A hard copy and/or easy access to an online soft copy of the Code will continue to be circulated to all employees and CSIR representatives, and will remain part of the induction packs for new employees and representatives;
- In line with international trends and practices, in October of each year the CSIR will create greater awareness of the principles in the Code as part of Global Ethics Month;
- Relevant aspects of the Code will be included in awareness presentations, training sessions and communication programmes to create awareness thereof among employees and relevant stakeholders.
- Further objectives of this training will include the following:
 - Assisting stakeholders to understand the meaning of fraudulent and corrupt behaviour;
 - Presenting case studies to assist employees in developing behaviour that articulate and encourage attitudes and values supporting ethical conduct; and
 - Communicating the implications of unethical behaviour and its impact for individuals, the workplace, professional relationships, the CSIR as a whole, external stakeholders and the public.

The Compliance function will continue with its responsibility for reviewing and revising the relevance and implementation of the Code, its communication and supportive education. This review and revision will also consider developments in international regulatory regime, thought leadership, and generally accepted principles in ethics.

E.3.3 SYSTEMS, POLICIES, PROCEDURES, RULES AND REGULATIONS

The CSIR has a number of systems, policies, procedures, rules and regulations designed to ensure compliance with prevailing legislation and limit the risk of fraud. Fundamentally, all stakeholders should be fully conversant and compliant with these. In addition, several operational measures have been designed to control business activities. The generic risks identified by the CSIR, in terms of systems, policies, procedures, rules and regulations, are as follows:

- Lack of knowledge and understanding of prevailing policies and procedures among employees;
- Lack of structured awareness and training programmes for employees in applicable policies, procedures, rules and regulations;
- Non-adherence to policies and procedures, as a result of weaknesses in systems and tools;

- Lack of proper delegation and misinterpretation of the Approval Framework; and
- Non-compliance due to the absence of a culture of compliance and a shared value system.

The aforementioned risks suggest that controls should be reviewed continuously to secure tolerable levels of compliance.

The CSIR recognises that its employees are often best placed to identify shortcomings or weaknesses in systems and procedures. Therefore, it is committed to harnessing this knowledge through the development of a structured programme aimed at encouraging employee commitment and effort in reporting such weaknesses. In addition, the CSIR continues to undertake the following actions to mitigate the risks identified:

- A training programme on the Code, finalised in FY 2024/25 will continue and be scaled up to guide CSIR activities on fraud prevention and management into the future. These activities take the form of in-person training, online tuition, CSIR intraweb snippets, posters, and so forth;
- Review of other CSIR policies that may be in conflict with the Code to bring them in harmony with the Code's core principles and prescribed procedures;
- Review of relevant CSIR policies to align them with the UN Global Compact and the UK Pact;
- Distribution of pocket-size and/or access to online copy, as circumstances may demand, of quick reference booklet on the Code to employees;
- Internal audits and ad hoc risk assessments, either in accordance with a combined assurance plan or due to a perceived risk, will continue to be undertaken to monitor and evaluate the extent of compliance with policies and procedures. This exercise may also take the form of surprise audits in areas of the organisation identified as of high risk or strategic importance where an undetected incident of fraud could have a seriously devastating effect;
- In instances where breaches occur, swift and appropriate disciplinary action will be undertaken to set an example to other potential wrongdoers;
- Staff and third-party or stakeholder (security) vetting. This exercise involves checks on employment references, criminal records, civil judgement records, disciplinary records, insolvency enquiries, connections with other businesses, validity of qualification and the like for prospective employees. To this end the CSIR is in the process of acquiring an electronic tool to conduct due diligence exercises on all stakeholders with whom it engages. This will assist the CSIR in mitigating the risk of reputational damage by association; and
- A specific effort will be made to ensure that measures are put in place for the censure of suppliers and/or other providers of goods and/or services found guilty of unethical conduct or other irregularities. Any employee found to be colluding with suppliers will be subjected to immediate disciplinary action with a possible sanction of dismissal and/or personal liability for losses suffered.

E.3.4 DISCIPLINARY CODE AND PROCEDURE

The CSIR Disciplinary Code and Procedure prescribes appropriate steps to be taken to resolve disciplinary matters. The identified risks of fraud with regard to discipline and the application thereof are as follows:

- In some instances, the disciplinary process is too lengthy;
- Inadequate training of investigating officers presenting cases and parties chairing or adjudicating the charges;
- Inadequate maintenance and security of source documents to be used in disciplinary, criminal and civil proceedings; and
- Inconsistent application of rules, disciplinary actions and outcomes.

The CSIR recognises that the consistent, fair and efficient application of disciplinary measures is an integral component of making the FPP a success. The CSIR will continue to pursue the following steps to ensure the consistent, efficient and speedy application of disciplinary measures:

- With the HC department having reviewed and realigned the Disciplinary Code and Procedure with the principles of the Code by establishing specific offences emanating from the Code the Legal and Compliance portfolio, will continue with its training and awareness programme;
- Ensuring all managers are aware of the content of the Disciplinary Code and Procedure, their responsibility for maintaining discipline, the standards of discipline expected of them, the procedure for the application of disciplinary measures and the disciplinary process through communication and awareness exercises;

- Ongoing training of managers and investigating officers regarding the content of the Disciplinary Code and Procedure, the application of disciplinary measures and process, and sustaining this training in conjunction with the Compliance function and HR department;
- The development of a system to facilitate the consistent application of disciplinary measures, e.g., a monitoring system that includes proper record keeping of all disciplinary actions taken;
- The development of a system in which managers are held accountable for the management and addressing of misconduct and fraud within their areas of oversight; and
- Implementation of private and/or public recognition (as circumstances may demand) of those employees and other stakeholders who display conscientiousness by reporting fraudulent activities.

E.3.5 INTERNAL CONTROLS

This section of the FPP relates to basic internal controls to prevent and detect fraud. The systems, policies, procedures, rules and regulations of the CSIR prescribe various controls, which, if effectively implemented, will limit fraud within the CSIR. These controls may be categorised as follows, it being recognised that the categories contain overlapping elements:

- Prevention controls: These are divided into two sub-categories, namely;
 - » Authorisation; and
 - » Physical.
- Detection controls: These are divided into four categories, namely:
 - » Arithmetic and accounting;
 - » Physical;
 - » Supervision; and
 - » Management Information.

PREVENTION CONTROLS

Authorisation:

All transactions require authorisation or approval by a responsible person with the appropriate authority limits. The authority limits are specified in the CSIR Approval Framework, which has recently been reviewed and approved by the Board.

Physical:

These controls are mainly concerned with the custody of assets and involve procedures and security measures designed to ensure that access to assets is limited to personnel who have been duly authorised, in writing. The CSIR Fixed and Movable Assets Policy governs the controls associated with the recognition, de-recognition, financing and transfer of assets.

DETECTION CONTROLS

Arithmetic and accounting:

These are basic controls within the recording function that ensure transactions to be recorded and processed have been authorised and that they are completely and correctly recorded and accurately processed. Such controls include checking the arithmetical accuracy of records, the maintenance and checking of totals, reconciliation and accounting for documents.

Physical:

These controls relate to the security of records and therefore, they underpin arithmetic and accounting controls. Their similarity to preventive controls lies in the fact that they are also designed to limit access to unauthorised persons.

Supervision:

This control relates to managers' supervision of day-to-day transactions and the recording thereof.

Management information:

This relates to the review of management accounts and budgetary control. These controls are normally exercised by management outside the day-to-day routine of the system.

Segregation of duties:

The lack of segregation of duties, or the overriding of existing internal controls, is a generic risk that exposes the CSIR to the inherent risk of fraud and manipulation of data. One of the primary means of control is the separation of responsibilities or duties, which, if combined, enables one individual to record and process a complete transaction, thereby providing him or her with the opportunity to manipulate the transaction irregularly and commit fraud.

Segregation of duties reduces the risk of intentional manipulation or error and increases the element of verification. Functions that should be separated include those of recording, checking, authorisation, approval, custody, execution and, in the case of computer-based accounting systems, system controller functions and daily operations.

In the context of fraud, segregation of duties lies in separating either the authorisation or custodial function from the verification function, thus introducing and maintaining vital checks and balances in the performance of fraud-prone obligations. To ensure that these internal controls are applied effectively and consistently, deficiencies and non-compliance identified by internal audit will be addressed as follows:

- The CSIR will continue to regularly re-emphasise to all managers that consistent compliance by employees with internal controls is in itself one of the fundamental controls in place to prevent fraud. Managers will be encouraged to recognise that internal control shortcomings identified during audits are, in many instances, symptoms and that they should strive to identify and address the root causes of these weaknesses.
- The CSIR will ensure that the performance appraisal of senior managers takes into account the number of audit queries raised and the seriousness of the consequent risk to the CSIR, resulting from identified internal control deficiencies. This is intended to raise the level of accountability for internal control by the Accounting Officer and managers. Where managers do not comply with basic internal controls, e.g., non-adherence to the limits of the CSIR Approval Framework, firm disciplinary action will be considered.

E.3.6 PHYSICAL AND INFORMATION SECURITY

Physical security:

Recognising that effective physical security is one of the “front line” defences against fraud, the CSIR will take regular steps to improve physical security and access control at its sites of operation, to limit the risk of asset theft. The CSIR will also conduct regular review of the physical security arrangements at its offices and facilities and address any weaknesses identified.

Information security:

The CSIR will ensure that employees are regularly sensitised to the risks of fraud associated with poor information security management, in order to enhance their understanding of these risks and the potential impact on CSIR. The CSIR’s efforts, through its ICT function, include continuous information security breach testing, simulations and awareness initiatives.

Regular reviews of information and computer security will also be conducted. Weaknesses identified during these reviews will be addressed with the relevant managers. The CSIR Information Security Policy expresses the CSIR’s position and intent to implement, maintain and improve its information security measures.

E.3.7 DETECTING, REPORTING AND INVESTIGATING FRAUD

Detection controls are designed to identify fraud or corruption as soon as possible after its occurrence. Despite best-practice prevention activities, fraud and corruption may still occur. The next line of defence is a robust suite of detection strategies to identify incidents as early as possible to minimise any detrimental impacts. The CSIR’s detection controls include:

- Maintaining an effective system of internal controls;
- Review and approval of financial transactions;
- Review and approval of management reports;
- Internal and external audits;
- Monitoring and evaluation;
- Data analysis; and
- The CSIR Ethics Hotline Procedure for reporting allegations of fraud, corruption and unethical conduct.

E.3.8 RESPONSE

The CSIR's response strategies ensure that appropriate mechanisms are in place to:

- Take corrective actions;
- Minimise the impact of fraud and corruption risks;
- Improve prevention and detection strategies; and
- Report occurrences to relevant stakeholders.

All identified occurrences of fraud and corruption will be investigated in accordance with the principles enshrined in the Protected Disclosure Act, 2000 (Act 26 of 2000), the CSIR Ethics Hotline Procedure and this FPP. The principles include confidentiality, protection from victimisation and the application of justice. Key CSIR response strategies include:

- Investigation of all allegations of fraud and corruption;
- Maintenance of a central registry of all fraud and corruption allegations, for reporting and monitoring;
- Disciplinary procedure;
- Review of internal controls following an incident;
- Implementation of corrective and preventative actions and recommendations;
- Recovery of losses through appropriate legal mechanisms;
- Fidelity and employee dishonesty insurance; and
- Reporting criminal behaviour to the relevant authorities for investigation and possible prosecution.

E.3.9 WHISTLE BLOWING AND PROTECTION OF WHISTLE BLOWERS AND THE FALSELY ACCUSED

Based on the Protected Disclosures Act, the CSIR commits to guaranteeing protection to whistle blowers and stakeholders against victimisation and aims to encourage and enable stakeholders to raise serious concerns without fear. To ensure the effectiveness of these protection measures, the hotline is administered by an independent third-party organisation that undertakes strict confidentiality. It is also essential that CSIR ensure appropriate professionals are trained in, and understand, professional privilege and confidentiality in the conduct of investigations, and that consistent disciplinary action is taken against those who breach these principals. These professionals are the Compliance function within the Legal and Compliance portfolio and, by virtue of their training and work, appreciate the legal the principles of confidentiality and legal privilege and the serious consequences of breaches thereof. Through education, screening of reported cases to establish prima facie evidence of misconduct or breaches of the Code and, where necessary, disciplinary action against false accusers, the CSIR aims to limit abuse of the reporting system.

The protected disclosures framework must also be able to identify hoax or reports or allegations that arising from personal conflict or possess political or racial motives that do not genuinely indicate suspected fraud or corruption. Identifying such cases is critical to maintaining the integrity of the hotline and preventing unnecessary use of organisational resources.

E.4 FURTHER IMPLEMENTATION AND MAINTENANCE

E.4.1 CREATING AWARENESS

This component of the plan comprises two approaches, namely education and communication. The strategic weaknesses identified in this area are as follows:

- Lack of a formalised strategy to create awareness among employees of the manifestations of fraud and the risks of fraud facing the CSIR; and
- Lack of knowledge of approaches to prevent and detect fraud in specific processes and transactions.

KEY CSIR RESPONSE STRATEGIES INCLUDE:

Education:

The CSIR will ensure that regular presentations and formal training are conducted for employees to enhance their understanding of the manifestations of fraud, fraud prevention and detection techniques and the components of the FPP.

Communication:

Communication is crucial in creating awareness of the FPP among employees and other stakeholders. This is intended to facilitate a culture in which stakeholders strive to make the FPP a success and sustain a positive, ethical culture within the CSIR. This will increase the likelihood of fraud being reported and improve the CSIR's prevention and detection capabilities.

The CSIR will consider various means of communicating its fraud prevention initiatives, some of which are already being implemented, including the following:

- Conducting workshops and creating awareness about the FPP;
- Developing a poster campaign aimed at all stakeholders to advertise the CSIR's stance on fraud and its expectations with regard to the ethics and integrity of all stakeholders;
- Circulating appropriate sections of the Code to other stakeholders and integrating by reference and through a web link, the Code into all contracts (e.g., consultants and contractors);
- Publicising "lessons learned", following investigations into allegations of fraud among employees;
- Circulating successes related to the FPP and fraud modus operandi;
- Placing notices or other communiqués related to the FPP on notice boards and in other areas to which employees and the public have access;
- Providing copies of the Code to suppliers of goods and services and seeking written commitments from them, as a precondition to contracting with the CSIR;
- Developing promotional items communicating the FPP or components thereof; and
- Using the intranet to communicate issues relating to the prevention and detection of fraud, including matters reported and actions taken.

E.4.2 COMBINED ASSURANCE FORUM/COMMITTEE

The CSIR has established an operationally based combined assurance collaboration forum to steer and take responsibility for the FPP and ensure its effective implementation, in support of combined assurance and to ensure that key fraud risks are being managed appropriately within the CSIR. The objectives of the combined assurance forum are mainly to:

- Identify and specify the sources of assurance over the CSIR's risks;
- Provide the ARC, HRSEC, Accounting Officer and Executive Management with a framework of the various assurance parties;
- Establish a combined assurance strategy and plan;
- Link risk management activities with assurance activities;
- Assist the Accounting Officer in reviewing the effectiveness of the risk management system; and
- Provide a basis for identifying areas of potential assurance gaps.

The forum is responsible for the ongoing maintenance and review of the FPP, including:

- Evaluating reports of fraud and highlighting areas of risk within the CSIR;
- Considering fraud threats to the CSIR and addressing them;
- Monitoring action taken to implement recommendations relating to incidents of fraud;
- Steering and taking responsibility for the FPP;
- Reviewing and making appropriate amendments to the FPP;
- Continuously monitoring the effectiveness of controls already in place and making improvements where necessary; and
- Ensuring that ongoing implementation strategies are developed and carried out.

E.5 CONTROL ENVIRONMENT

The CSIR's ARC and HRSEC significantly influence the fraud control environment, particularly by setting the tone at the top. This is done in the discharge of their duties in terms of the PFMA and Treasury Regulations. The ARC and HRSEC systematically oversee, and periodically review the internal controls established by the management of the CSIR. Oversight extends to:

- Enterprise risk and fraud risk management;
- The potential for management to override controls or exercise other inappropriate influence over the financial reporting process;
- Mechanisms for employees to report concerns;
- Receipt and review of periodic reports describing the nature, status and eventual resolution of alleged or suspected fraud;
- An internal audit plan that addresses fraud risk, and mechanisms to ensure that internal audit can express concerns about management's commitment to appropriate internal controls or report suspicions or allegations of fraud;
- The involvement of other experts, such as legal and HR, as needed to investigate any alleged or suspected wrongdoing;
- The review of accounting principles, policies and the reasonableness of significant estimates used by the CSIR;
- The review of significant non-routine transactions (if any) entered into by management and employees; and
- Functional reporting by internal and external auditors to the ARC.

E.5.1 INDEPENDENT ASSURANCE

The internal and external auditors will provide an independent assurance on the adequacy and effectiveness of the CSIR's internal controls to prevent, detect and manage fraud and corruption. The independent risk assurers will, in addition to assisting the CSIR in benchmarking the efficacy of its fraud management measures, also advise on the effectiveness of the CSIR's FPP.



MATERIALITY FRAMEWORK

EXECUTIVE SUMMARY

In terms of Treasury Regulations for government departments, trading entities, constitutional institutions and public entities, issued in terms of the PFMA, 1999, the CSIR must have a materiality framework defining acceptable levels of materiality and significance within the organisation.

The CSIR's reputation, built over more than half a century, depends on the nature of every business transaction, conducted by every employee, on a daily basis. It is built on an implicit set of values, inspires our employees to maintain the highest ethical standards in all their dealings with our clients and stakeholders, as well as their relationships within the CSIR.

The CSIR is committed to a policy of fair dealing and integrity in conducting its business. This commitment is based on a fundamental belief in honest, fair and legal conduct in all business activities. We expect all our employees to share this commitment to high morals, ethical and legal standards.

Ethics involve the ability to distinguish right from wrong and a commitment to do what is right. Values are core beliefs that shape individual attitudes. Although individual values may differ, this does not imply a choice about behaving ethically in the CSIR business environment. Our Code of Conduct, as well as the Constitution of the Republic of South Africa and the national laws and regulations, prescribes the legal conduct that embodies values based on ethical principles while respecting cultural diversity.

F.1.1 TREASURY REGULATION 28.1.5

"For purposes of "material" [sections 50(1), 55(2) and 66(1) of the Act] and "significant" [section 54(2) of the Act], the Accounting Authority must develop and agree on a framework of acceptable levels of materiality and significance with the relevant Executive Authority in consultation with the external auditors."

(HOWEVER, THE CSIR HAS BEEN EXEMPTED FROM SECTION 54 (2) AND THIS SCHEDULE DOES NOT INCLUDE THIS SUBSECTION.)

Table F1: CSIR Materiality Framework

Material	
Section 50 (1)	
(1) The Accounting Authority for a public entity must –	
(a) exercise the duty of utmost care to ensure reasonable protection of the assets and records of the public entity;	Significant audit findings that could negatively impact on the CSIR’s operations and the attainment of strategic goals.
(b) act with fidelity, honesty, integrity and in the best interest of the public entity in managing the financial affairs of the public entity;	The CSIR sets high standards on fidelity, honesty and integrity. The best interest of the public entity is always relevant in fulfilling its mandate and in the execution of the Shareholder’s Compact. Any acts of dishonesty, infidelity and others that are not in the best interests (from a research, financial and reputation perspective) of the CSIR are viewed in a serious manner
(c) on request, disclose to the Executive Authority responsible for that public entity or the legislature to which the public entity is accountable, all material facts, including those reasonably discoverable, which in any way influence the decision or actions of the Executive Authority or that legislature; and	The CSIR is committed to disclosing any relevant information to its stakeholders. Materiality can only be determined if the nature of the information is known.
d) seek within the sphere of influence of that Accounting Authority, to prevent any prejudice to the financial interests of the state	The CSIR employs an ongoing Enterprise Risk Management System, as well as controls that are aimed at the prevention/mitigation of any prejudice to the financial interest of the entity. Lack of the required governance processes, lack of due diligence in conducting business, and fruitless and wasteful expenditure are inherently regarded as material.
Section 55 (2)	
(2) The annual report and financial statements referred to by PFMA Subsection 55 (1)(d) must	
(a) fairly present the state of affairs of the public entity, its business, its financial results, its performance against pre-determined objectives and its financial position as at the end of the financial year concerned	Significance/ materiality is calculated as 1% of revenue, which amounts to R 32 985 516 .
(b) include particulars of –	
(i) any material losses through criminal conduct and any irregular expenditure and fruitless and wasteful expenditure that occurred during the financial year;	R1 000 000. All cases are unique and will thus be treated as such. These will be subject to internal audit reviews.
(ii) any criminal or disciplinary steps taken as a consequence of such losses or irregular expenditure or fruitless and wasteful expenditure;	R1 000 000. All cases are unique and will thus be treated as such. Issues that inform steps to be taken are: – The level of responsibility and position of the person involved; – The affected core business/support/ operational; and – The impact on other areas of operation of the CSIR. – These will be subject to internal audit reviews. – R1 000 000 (excluding losses incurred through normal operating activities) – Will disclose as prescribed.
(c) include the financial statements of any Subsidiaries	All subsidiaries are consolidated.

Material

Material	
Section 66 (1)	
(1) An institution to which this Act applies may not borrow money or issue a guarantee, indemnity or security, or enter into any other transaction that binds or may bind that institution or the Revenue Fund to any future financial commitment, unless such borrowing, guarantee, indemnity, security or other transaction –	The CSIR complies with this requirement
(a) is authorised by this Act; and	
(b) in the case of public entities, is also authorised by other legislation not in conflict with this Act; And	
(c) in the case of loans by a province or a provincial government business enterprise under the ownership control of a provincial executive, is within the limits as set in terms of the Borrowing Powers of Provincial Governments Act, 1996 (Act No 48 of 1996).	



FINANCIAL PLAN

G.1 CSIR BUDGET AND PARLIAMENTARY GRANT CASH FLOW 2026/27

G.1.1 CSIR STATEMENTS OF COMPREHENSIVE INCOME OVER THE MTEF PERIOD

Table G1: Statement of comprehensive income – MTEF period

Statement of comprehensive income	Forecast	Budget	Estimate	Estimate
	2025/2026	2026/2027	2027/2028	2028/2029
	R'000	R'000	R'000	R'000
Total Operating Revenue	3 207 221	3 298 552	3 357 120	3 440 650
R & D Contract Income	2 503 139	2 561 379	2 586 602	2 635 531
Public - South Africa	1 760 267	1 780 068	1 800 177	1 820 603
Private - South Africa	260 961	274 009	287 709	298 936
International	354 851	358 400	343 079	353 371
Parliamentary Grant - Ringfenced	127 060	148 903	155 637	162 621
Parliamentary Grant	702 070	735 084	768 325	802 817
Royalty Income	2 012	2 088	2 192	2 302
Other Income	-	-	-	-
Total expenditure	3 299 885	3 370 151	3 403 072	3 479 205
Employees' Remuneration	1 972 875	1 972 875	2 013 113	2 041 310
Operating Expenses	1 262 813	1 331 736	1 318 721	1 355 807
Depreciation	64 175	65 540	71 237	82 088
Profit/(Loss) before Investment Income	92 664	(71 599)	(45 952)	(38 555)
Net Finance Income	61 840	61 840	61 840	61 840
NET PROFIT/(LOSS)	30 824	(9 759)	15 888	23 285

G.1.2 CSIR STATEMENTS OF FINANCIAL POSITION OVER THE MTEF PERIOD

Table G2: Statement of financial position over the MTEF period

Statement of financial position	Forecast	Budget	Estimate	Estimate
	March	March	March	March
	2026	2027	2028	2029
	R'000	R'000	R'000	R'000
ASSETS				
Non-Current assets	1 102 169	1 103 012	1 123 836	1 187 206
Property, plant, equipment and lease assets	987 323	1 040 783	1 119 186	1 182 556
Interest in subsidiaries	4 650	4 650	4 650	4 650
Government grant receivables	110 196	57 579	-	-
Current Assets	1 839 231	1 823 096	1 767 023	1 796 730
Government grant receivables	63 009	63 009	-	-
Trade and other receivables	384 867	395 826	402 854	412 878
Inventory and contracts in progress	298 592	254 467	252 729	247 069
Cash and cash equivalents	1 092 763	1 109 795	1 111 439	1 136 783
TOTAL ASSETS	2 941 399	2 926 108	2 890 858	2 983 936
EQUITY AND LIABILITIES				
Reserves	1 453 862	1 444 102	1 459 990	1 483 275
Retained earnings	1 453 862	1 444 102	1 459 990	1 483 275
Non-current liabilities	126 052	73 177	15 379	15 195
Long-term payables	110 196	57 579	-	-
Post retirement medical benefits and lease liabilities	15 855	15 598	15 379	15 195
Current Liabilities	1 361 487	1 408 830	1 415 489	1 485 466
Long-term payables	63 009	63 009	-	-
Advances received	954 771	959 618	1 046 247	1 105 840
Trade and other payables	343 707	386 203	369 242	379 626
TOTAL EQUITY AND LIABILITIES	2 941 399	2 926 108	2 890 858	2 983 936

One needs to consider the budgeted current assets of R1.82 billion and a cash balance of R1.1 billion in conjunction with the current liabilities of R1.40 billion. The current ratio (current assets/current liabilities) remains stable at 1.30.

G.1.3 CSIR CASH FLOW STATEMENT

Table G3: CSIR cash flow statement

Cashflow statement	Forecast	Budget	Estimate	Estimate
	March 2026	March 2027	March 2028	March 2029
	R'000	R'000	R'000	R'000
Cashflow from operating activities				
Cash receipts from external customers	2 579 903	2 601 480	2 670 134	2 693 062
Parliamentary Grant income	702 070	735 084	768 325	802 817
Cash paid to suppliers and employees	(3 231 816)	(3 177 364)	3 291 217	(3 386 733)
Cash generated from/(utilised in) operating activities	50 157	159 200	147 242	109 146
Net finance income	61 840	61 840	61 840	61 840
Net cash inflow/(outflow) from operating activities	111 997	221 040	209 082	170 986
Cashflow from investing activities				
Acquisition of PPE	(165 000)	(151 133)	(149 640)	(145 458)
Net cash utilised in investing activities	(165 000)	(151 133)	(149 640)	(145 458)
Cashflow from financing activities				
Decrease in non-current liabilities	(46 981)	(52 875)	(57 798)	(184)
Net cash outflow from financing activities	(46 981)	(52 875)	(57 798)	(184)
Net increase/(decrease) in cash and cash equivalents	(99 984)	17 032	1 644	25 344
Cash and cash equivalents at beginning of the year	1 192 748	1 092 763	1 109 795	1 111 439
Cash and cash equivalents at end of the year	1 092 763	1 109 795	1 111 439	1 136 783

G.1.4 TWELVE MONTH CASH FLOW PROJECTION FOR PARLIAMENTARY GRANT: 2026/27 (INCLUDING VAT)

Table G4: Cash flow for PG

R'000	Total	April	July	October	January
TOTAL 2026 MTEF ALLOCATION	1 414 715	254 146	254 146	254 146	652 312
Baseline	845 347	211 337	211 337	211 337	211 337
National Laser Centre	46 953	11 738	11 738	11 738	11 738
Laser Loan Programme	13 784	3 446	3 446	3 446	3 446
African Laser Centre	7 530	1 883	1 883	1 883	1 883
Implementation: Foundational Digital Capabilities and ICT RDI Roadmap	102 971	25 743	25 743	25 743	25 743
Infrastructure Programme	69 042				69 042
National Integrated Cyber Infrastructure System	329 124				329 124

G.1.5 PPE BUDGET SUMMARY

Table G5: PPE budget summary

Category	2026/27 R'000
ICT equipment	72 553
Furniture and fittings	45 597
Scientific equipment	45 263
Buildings	2 910
Vehicles	700
TOTAL	170 023

The budgeted investment in property, plant and equipment for the 2026/27 FY is R170 million, which includes fully funded grant assets of R18.8 million for Scientific equipment.

Notwithstanding the fact that an item is included in the PPE budget, the investment remains subject to approval in terms of the CSIR Approval Framework and additional considerations such as strategic alignment, return on investment and available cash flow.

G.1.6 ALIGNMENT OF PARLIAMENTARY GRANT BUDGET AND STRATEGIC OBJECTIVES

Table G6: Link between PG and CSIR strategic objectives

PG Allocation Description	Strategic Objectives	2026/27 Indicative Allocation (excl VAT) R'000	2026/27 Indicative Allocation (incl VAT) R'000
Total Baseline Allocation		R 735,084	R 845,347
Baseline Allocation to Clusters	SO1,S02 & S03	R 319,021	R 366,875
Portfolios and Support Functions		R 237,000	R 272,550
Leadership Team	S05	R 44,028	R 50,633
Supply Chain Management	S05	R 6,791	R 7,810
Internal Audit	S05	R 10,293	R 11,837
Research and Development Office	S01,S02 & S03	R 9,507	R 10,933
Planning and Knowledge Management	S01,S02 & S03	R 27,025	R 31,079
BEI Operations	S01,S02 & S03	R 12,940	R 14,881
CSIR Board and sub committees	S05	R 3,169	R 3,645
Legal Services	S05	R 20,323	R 23,372
Compliance	S05	R 5,663	R 6,512
Knowledge Commons	S05	R 3,736	R 4,297
FMSS - Embedded Engineering support	S05	R 3,621	R 4,164
Information and Communication Technology	S05	R 39,149	R 45,022
Human Capital	S04 & S05	R 30,586	R 35,174
Strategic Communications and Stakeholder Relations	S05	R 20,167	R 23,192
Capability Development Programmes (Previously: Strategic Programmes) - Thematic		R 119,908	R 137,894
Research Centres	S01,S02 & S03	R 45,000	R 51,750
New Capability Development Initiatives	S01,S02 & S03	R 20,000	R 23,000
RDI Infrastructure	S01,S02 & S03	R 15,000	R 17,250
Human Capital Skills Development	S04	R 39,908	R 45,894
Commercialisation and Technology Transfer (Thematic)		R 30,000	R 34,500
C ³	S01,S02 & S03	R 26,000	R 29,900
Parliamentary Grant (PG) Investment: Pilot Venture Builder Programme	S01,S02 & S03	R 4,000	R 4,600
Commercialisation Capacity Investment	S01,S02 & S03	R0	R0
Governance Structures and CSIR Committees		R 1,615	R 1,857
CSIR Board and sub committees	S05	R 1,000	R 1,150
Research Ethics Committee		R 515	R 592
PG Investment Committee & Industry Panel	S05	R 100	R 115
Discretionary Allocations (To be invested upon receipt of motivations)		R 27,540	R 31,671
Strategic Initiatives	S05	R 27,540	R 31,671
Ring-Fenced Allocations		R 503,828	R 579,402
Laser Loan Programme	SO2 & SO3	R 11,986	R 13,784
National Laser Centre	SO2 & SO3	R 40,829	R 46,953
African Laser Centre	SO2 & SO3	R 6,548	R 7,530
Implementation: ICT R&D Strategy	SO2 & SO3	R 89,540	R 102,971
Infrastructure Programme	SO2 & SO3	R 60,037	R 69,042
National Integrated Cyber Infrastructure System (NICIS)	SO2 & SO3	R 286,195	R 329,124
Total		R 1,230,218	R 1,414,751

Table G7: Medium Term Expenditure Framework allocation to the CSIR (excl VAT)

Category	2024/25	2025/26	2026/27	2027/28
	R'000	Revised R'000	Revised R'000	R'000
Baseline Parliamentary Grant	679 721	702 070	735 084	768 325
Parliamentary Grant	679 721	702 070	735 084	768 325
Ring fenced allocation	422 546	468 192	495 135	526 613
Laser Loan Programme	10 970	11 461	11 986	12 528
National Laser Centre	37 366	39 040	40 829	42 675
African Laser Centre	5 992	6 261	6 548	6 844
Implementation: ICT R&D Strategy	62 381	85 617	89 540	93 590
Infrastructure Programme	59 917	63 449	60 037	60 728
National Integrated Cyberinfrastructure System (NICIS)	245 920	262 364	286 195	296 661
TOTAL	1 102 267	1 170 262	1 230 219	1 281 351

G.2 FIVE-YEAR AUTHORITY TO ISSUE GUARANTEE INSTRUMENTS

Table G8: CSIR Five-year authority to issue guarantee instruments

Financial year ending	Total annual limit R million
31 March 2026 *	690.14
31 March 2027 *	699.04
31 March 2028 **	699.04
31 March 2029 **	699.04
31 March 2030 **	699.04

* This is an approved amount

** This is a planned amount

The CSIR has obtained NT approval to issue guarantee instruments not exceeding the above set limits. This approval is set to expire on 31 March 2027. The approval was granted under the following conditions:

- The CSIR must submit quarterly reports to NT on utilisation of the annual limit;
- The CSIR's liquid assets may not fall below R1.47 billion while the approval is in effect; and
- The CSIR must report disputes and/or contraventions related to contracts for which an authorised guarantee is attached.



CSIR TOP RISKS

1. SYSTEMIC RISK:

Regulatory environment: Inter-governmental/public sector procurement constrains

Inadequate and ineffective implementation of public sector procurement requirements by government departments, constitutional institutions and public entities restricts the CSIRs ability to deliver on its mandate and delivery of objectives and goals.

Inherent risk rating	Previous residual risk rating	Current residual risk rating
High	Medium	Medium

Risk rating rational:

The risk has been on the radar from the 2019/20 to the 2025/26 FY:

- The risk remains medium due to the approval and implementation of NT note 3 that empowers accounting authorities and/or executives in government, constitutional and public entities to contract with other entities based on a fair and transparent sole and/or single source supplier deviation process.
- CSIR engagement with Director-General: DSTI was used to initiate a plan to engage NT on exemption request with some public sector entities.
- The risk associated with the bottleneck in NT approval of deviation(s) is mitigated as entities are authorised to approve transactions/contracts.
- Standardised procurement regulations amongst public sector institutions governed by the PFMA and applicable regulations requires competitive bidding.
- There is no clear and/or uniform guideline or understanding of the exemption process and criteria by public sector organisations
- MoUs and MoAs do not always translate into contracts.

Key mitigation initiatives:

- A memo to cabinet to request changes to the CSIR Act and mandate to support the current procurement legislation regime. The memo will be sent to the Minister for approval and presentation to Cabinet with the President.
- Continued engagement (change management) with NT and clients/partners to create awareness of the CSIRs unique value proposition and the mandated role of national RD&I capabilities in enabling a capable state.
- Completion of a market analysis to support motivation for the CSIR to be considered sole and/or single source for certain strategic contracts e.g. TSO.
- Continuous collaborations and engagement with public sector institutions on existing exemptions (MoUs/MoAs) and the potential for new exemptions (change management, awareness and education on NT note 3).
- The CSIR continues to tender for public sector contracts.
- Collaboration with private sector organisations through sub-contracting.

Risk appetite and tolerance level:

- The risk is within appetite and can be tolerated, as the introduction of NT note 3 mitigated the key bottleneck of the deviation approval process by NT prior to contracting.
- Client change management by the CSIR is crucial to managing the risk at a low level and establishing controls to ensure NT procurement compliance and manage potential audit concerns.

2. SYSTEMIC RISK: Financial unsustainability

Financial unsustainability due to continuous reduction in PG funding, reduced revenue with escalating costs compounded by a slow uptake/commercialisation of CSIR capabilities and IP, and reduced investment in RD&I.

Inherent risk rating	Previous residual risk rating	Current residual risk rating
High	Medium	High

Risk rating rational:

- The risk is considered high based on Exco analysis/voting but assessed as a medium risk in the context of recent financial performance and remains relevant due to market uncertainties.
- The CSIR exceeded several of the KPI targets and achieved 29 out of 31 (94%) KPI targets for the 2024/25 FY.
- The organisation has achieved an overall performance score of two. The CSIR also exceeded targets for total income and net profit through the diversification of our income streams, in line with the strategy.
- A clean audit was achieved from the Auditor-General.
- The CSIR maintained a level 1 BBBEE status.
- The debt management plan is improving and collections from clients are positive.
- Global economic slow-down, geo-political conflicts and unprecedented trade tariffs are additional risk drivers being monitored.

Key mitigation initiatives:

- Cash preservation and optimised investment to increase investment returns.
- All clusters have income diversification strategies (public, private, and international income).
- Allocation of PG to priority areas.
- Engagement with the DSTI to increase PG allocation to the CSIR.
- Continuous review and repositioning of the non- performing business areas.
- Establishment of CSIR C³ and BD&C capability to explore commercialisation opportunities.
- Retention and market alignment of key SET skills to remain relevant to industry needs.
- BD&C strategy is focused on increasing private sector income.

Risk appetite and tolerance level:

The risk is within appetite and tolerance level and is supported by the organisation’s financial performance in the 2024/25 FY.

3. SYSTEMIC RISK:

US funding/aid cut:

Inherent risk rating	Previous residual risk rating	Current residual risk rating
High	N/A	High

Risk rating rational:

US funding cuts could have a negative impact on CSIR projects dependent on this aid. The risk is being monitored by the affected business areas and relevant mitigation strategies are being implemented. The risk is exacerbated by the following factors:

- Global geopolitics and US foreign policy position.
- The USA perceives South Africa as increasingly aligned with BRICS nations as BRICS expands its membership and influence.
- Policy positions of the new US administration towards South Africa.

Key mitigation initiatives:

- Sourcing alternative funding from industry and government
- Implementing income diversification strategy including opportunities in the EU

Risk appetite and tolerance level:

The risk is within the appetite and tolerance level as the organisation hasn't experienced a significant impact from the funding cuts. Relevant business areas continue to monitor the risk.

4. SYSTEMIC RISK:

Business Continuity Risk 1 - Security of electricity supply.

Decreasing load reduction by Eskom with some level of stability reduces the risk of loss of electrical supply to the CSIR, as well as the impact of increased diesel costs and operational disruptions.

Inherent risk rating	Previous residual risk rating	Current residual risk rating
High	Medium	Low

Risk rating rationale:

- The risk moved from medium to low due to decreasing load reduction levels; however, the Scientia campus continues to experience sporadic power cuts resulting in operational disruptions (unplanned power cuts by City of Tshwane).
- Generators have been installed at CSIR sites to manage business interruptions due to power failures.
- Ongoing consultation with clusters and portfolios is undertaken to determine Business Continuity Plans (BCPs) for key business areas, systems, infrastructure, people, suppliers, and processes.
- Theft and sabotage of electricity infrastructure by criminals exacerbates the risk.
- There is an inadequate funding stream to invest in alternative power/energy.

Key mitigation initiatives:

- Regular maintenance of existing electrical infrastructure.
- Incident Response Team has defined BCPs/strategies for different short-term risk scenarios faced by the CSIR.
- The current risk-response strategy is shifting focus to long-term investment aligned with increased energy efficiency, associated savings (ROI) and reduction of the carbon footprint.

Risk appetite and tolerance level:

Risk is within appetite and tolerance due to significantly reduced load reduction schedules and associated operational costs.

5. SYSTEMIC RISK:
Extreme weather conditions

Unprecedented weather conditions with a potential to impact negatively on CSIR sites

Inherent risk rating	Previous residual risk rating	Current residual risk rating
Medium	N/A	Medium

Risk rating rational:

Extreme weather conditions have the potential to negatively impact CSIR infrastructure, field projects and exposure to SHE incidents. The risk is driven largely by the following factors:

- Climate Change.
- Facilities built-in low-lying areas (increasingly unprecedented weather conditions and infrastructure misaligned to deal with these events).
- Poor location of Rosebank site.

Key mitigation initiatives:

- Monitoring conditions and having appropriate plans to react before events become catastrophic – e.g. sandbags, timely evacuation, and so forth.
- Disaster preparedness and monitoring.

Risk appetite and tolerance level:

The risk is within appetite and tolerance level but may escalate due to the unprecedented weather conditions.

6. STRATEGIC RISK:

Inadequate pace and scale of CSIR IP Commercialisation.

The CSIR is unable to commercialise its IP at a sufficient pace and scale in line with the strategic intent of the organisation.

Inherent risk rating	Previous residual risk rating	Current residual risk rating
Medium	Medium	Medium

Risk rating rational:

- There is a slight risk movement to medium risk based on the state of generally robust controls to ensure IP commercialisation and the establishment of CSIR C³.
- BD&C capability has been established.
- Lack of market visibility/marketing of CSIR capabilities limits effective commercialisation.
- High cost of patent filing.
- Pipeline outputs not aligned to market needs/requirements.
- Long lead time for technology/capability development resulting in misalignment with market changes/needs.

Key mitigation initiatives:

- Establishment of Industry Advisory Panels to improve market alignment of R&D investments.
- Rollout of the Stage Gate Methodology to ensure consistent and effective management of investment in capabilities and technologies.
- Focus on commercialisation initiatives that fund high potential technologies to enhance market readiness.
- Participation and networking in formal events of industry bodies, OEMs, professional communities of practice, forums, conferences, and so forth.
- Participation in local and international trade shows.
- Use the CSIR conference to create visibility.
- Commercialisation initiatives that fund several high potential technologies seeking to enhance market maturity.

Risk appetite and tolerance level:

The current level of IP commercialisation is acceptable and within tolerance levels, it can however be improved with planned/future mitigation strategy to improve the overall state of IP of commercialisation.

7. STRATEGIC RISK:

Inability to attract and retain new and experienced SET skills, expertise and transformed employee profile from the market.

The CSIR's inability to attract and retain new, experienced and transformed SET skills from the market will result in failure to deliver on business objectives and transformation imperatives.

Inherent risk rating	Previous residual risk rating	Current residual risk rating
High	High	High

Risk rating rational:

There is a national scarcity of STEM skills/expertise impacting the CSIR capability. The risk remains high, with varying profiles across business areas depending on critical skills requirements (e.g. process engineering, data modelling, ICT).

Key risk drivers include:

- Industry demand exceeding the supply of STEM skills and expertise.
- Loss of experienced and skilled staff to competitors.
- Changed innovation landscape in terms of personnel, especially universities attracting a significant pool of staff due to the environment perceived less pressurized in terms of raising contracts.
- A limited pool of skilled and transformed women as well as people with disabilities.
- Inherent demanding nature of the RD&I working model (being a researched, admin, project management, marketing, tendering for business, people management)
- CSIR skills and capability requirements exceeding industry minimum standards.
- Declining uptake of STEM qualifications at higher education institutions.
- HC has initiated and implemented targeted strategic interventions to address skills deficit, including attraction and retention.
- Notable growth in the number of chief and principal researchers.
- Ongoing initiatives to address employees' career aspirations and provide development opportunities (bursaries, Leadership and Management Development Programme, Executive Development Programme, Mentoring and coaching programme).

Key mitigation initiatives:

- Implementation of capability development programmes, which seek to address pipeline gaps and support progression of SET employees e.g. Young Researchers Establishment Fund. Accelerated Principal and Chief Researcher Development Programme (APRDP).
- Establish succession planning (development) for high performing researchers to align investment in capability programme.
- Career ladder promotions to ensure skills retention.
- Implementation of career paths for support staff.
- Implementation of climate survey action plans.
- Identification of specific skills needs to facilitate focused training and development.
- Internal assessments to identify skills gaps and design targeted strategies e.g., women in science.
- Contribution to the national retention drive by reducing critical skills attrition within the CSIR.

Risk appetite and tolerance level:

The risk is within appetite and tolerance level as the organisation is able to deliver on the strategic objectives and goals despite market mismatch between (demand vs supply) of critical skills.

8. STRATEGIC RISK:

Business Continuity Risk 2 – Ageing and failing infrastructure.

Ageing infrastructure prone to failures and downtime exacerbated by increased and costly maintenance.

Inherent risk rating	Previous residual risk rating	Current residual risk rating
High	High	High

Risk rating rational:

- The risk remains high due to insignificant progress in implementing key controls due to insufficient CAPEX to fund renovations, maintenance and investment in new infrastructure for:
 - » Physical accommodation infrastructure;
 - » Utility infrastructure;
 - » ICT infrastructure; and
 - » R&D infrastructure.
- The CSIR continues to invest in R&D infrastructure as informed by strategic and business plans.
- Mission critical infrastructure has been identified for replacement subject to CAPEX availability
- Phase 1 of network upgrade project is being implemented.
- Focus is on identifying different classes of infrastructure and aligning them to the outputs of the building condition assessment and the ICT roadmap.

Key mitigation initiatives:

- Implement planned preventative maintenance and attend to unplanned breakdowns as they occur.
- Develop and implement an infrastructure investment framework and roadmap for all infrastructure investment requirements.
- Develop long-term infrastructure life-cycle management.
- Obtain infrastructure funding from NT and grant funding.
- Implement space optimisation strategy that considers CSIR occupied space, remote working and leasing mix.
- Apply for NT funding and NRF equipment funding for investment into critical aged infrastructure.
- Resolve findings from the building condition assessment based on the prioritisation of high-risk items.
- Implement phased ICT investment on high priority items in line with the ICT strategy and roadmap.

Risk appetite and tolerance level:

The risk is unacceptable but can be tolerated due to the general state of infrastructure and current maintenance plans are deemed effective. The organisation has not experienced material operational disruptions due to infrastructure failures.

9. OPERATIONAL RISK:

Ineffective and inefficient business processes and systems

Inadequate enhancement of business systems and processes.

Inherent risk rating	Previous residual risk rating	Current residual risk rating
High	High	Medium

Risk rating rational: The risk has reduced from high to medium due to the following:

- Priority is focused on the practical implementation of priority systems, process and to eliminate current constraints.
- Achievement of several milestones achieved in the implementation of the ICT strategy and roadmap.
- Insufficient/inadequate OPEX and CAPEX funding investment requirements.
- Lack of a clear systems integration strategy.
- Siloed/disintegrated business process.
- Aging and obsolete ICT infrastructure that may not support systems and processes enhancement.
- Procurement tracking tool and new payroll system implemented.
- A number of policies, frameworks, guidelines and processes were reviewed (Finance, HC, LCBE, SCM and ICT).
- ICT migrated from the Micro-Focus suite of products to Microsoft, where significant information is stored on the cloud to reduce constraints on infrastructure capacity.
- Investment in infrastructure, allowing for the repurposing of infrastructure to service additional organisational needs.

Key mitigation initiatives:

- OPCO focused on the review of key organisational processes to drive operational efficiency and agility.
- Development of a structured business systems investment plan to upgrade and address priority business requirements.
- Establishment of standing SSC and PSC committees in FM&SS.

Risk appetite and tolerance level:

Risk is acceptable and can be improved with the planned interventions. The organisation has not experienced significant operational interruptions due to internal process and/or system failures.

10. OPERATIONAL RISK:

Cyber attacks

Information security breaches (unauthorised access to systems, data and information)

Inherent risk rating	Previous residual risk rating	Current residual risk rating
High	Medium	Medium

Risk rating rational:

- The risk is inherently high due to the general state of cyber-attacks and threats that can materialise at any point, however the risk is internally under control due to improved information security controls supported by recent minor cybersecurity incidents and continuous staff awareness campaign.
- Information Security Office in collaboration with the ICT management team has implemented several information security controls to mitigate different cyber threats.
- An information security roadmap/strategy is defined as part of the overall ICT strategy/roadmap.
- Outdated and systems running on old technology platforms.
- User ability to change configuration settings on end point devices, applications and enterprise equipment.
- Use of potentially vulnerable tools, such as virtual private networks that lack adequate safeguards, amplifying the threat to individuals and organisation.

Key mitigation initiatives:

- Continuous cybersecurity awareness and training.
- Intrusion prevention and detection solutions implemented and periodically assessed.
- Regular patch management.
- Periodic penetration testing and audit of ICT infrastructure.
- Logical access control including super users.
- Malware protection service (Sophos) is fully functional and receives updates directly from the internet.

Risk appetite and tolerance level:

The risk is within appetite and tolerance level. The organisation has a zero-risk appetite for information security breaches and incidents with the potential for unauthorised access to sensitive and confidential data/information, including exposure of private and personal information (POPIA).

11. OPERATIONAL RISK:

Inadequate security measures

Breach in CSIR security measures resulting in loss of assets, classified information, malicious damage to physical property and endangerment to staff, tenants, contractors and visitors.

Inherent risk rating	Previous residual risk rating	Current residual risk rating
High	High	Medium

Risk rating rational:

The risk is considered medium due to internal controls deployed at the Paardefontein, sporadic physical security breaches and theft of mobile assets. Adequate physical security measures implemented at Paardefontein site with a medium residual risk due to the nature of operations.

The following interventions were implemented to improve the security of crucial CSIR sites:

- Appointed a qualified physical security service provider for the provision of security services to all the CSIR sites.
- Deployment of a patrol vehicle with armed response at Paardefontein.
- Installation of CCTV monitoring systems with artificial intelligence and video analytics capabilities covering the perimeter fence at Paardefontein, Rosebank and Durban.
- Implemented CCTV systems with automatic number plate recognition.

Key mitigation initiatives:

- Upgrade of priority security infrastructure.
- Development of a Security Capability Master Plan/strategy and road map that addresses the security threat and risks identified at all CSIR campuses.
- Implementation of a strategy that includes the development of security capability architecture, a security operational concept, and the integration of security systems into existing CSIR support systems.

Risk appetite and tolerance level:

The risk is outside appetite and tolerance levels as the CSIR has zero appetite for security incidents that could result in loss of and/or damage to property or injury or risk to people's safety and security.

12. OPERATIONAL RISK:

Loss of mobile assets

Loss of mobile assets (Laptops, ipads, tablets and screens).

Inherent risk rating	Previous residual risk rating	Current residual risk rating
High	High	Medium

Risk rating rational:

The CSIR has implemented an asset management framework that highlights key internal controls to manage assets losses.

However, the risk remains due to the following factors:

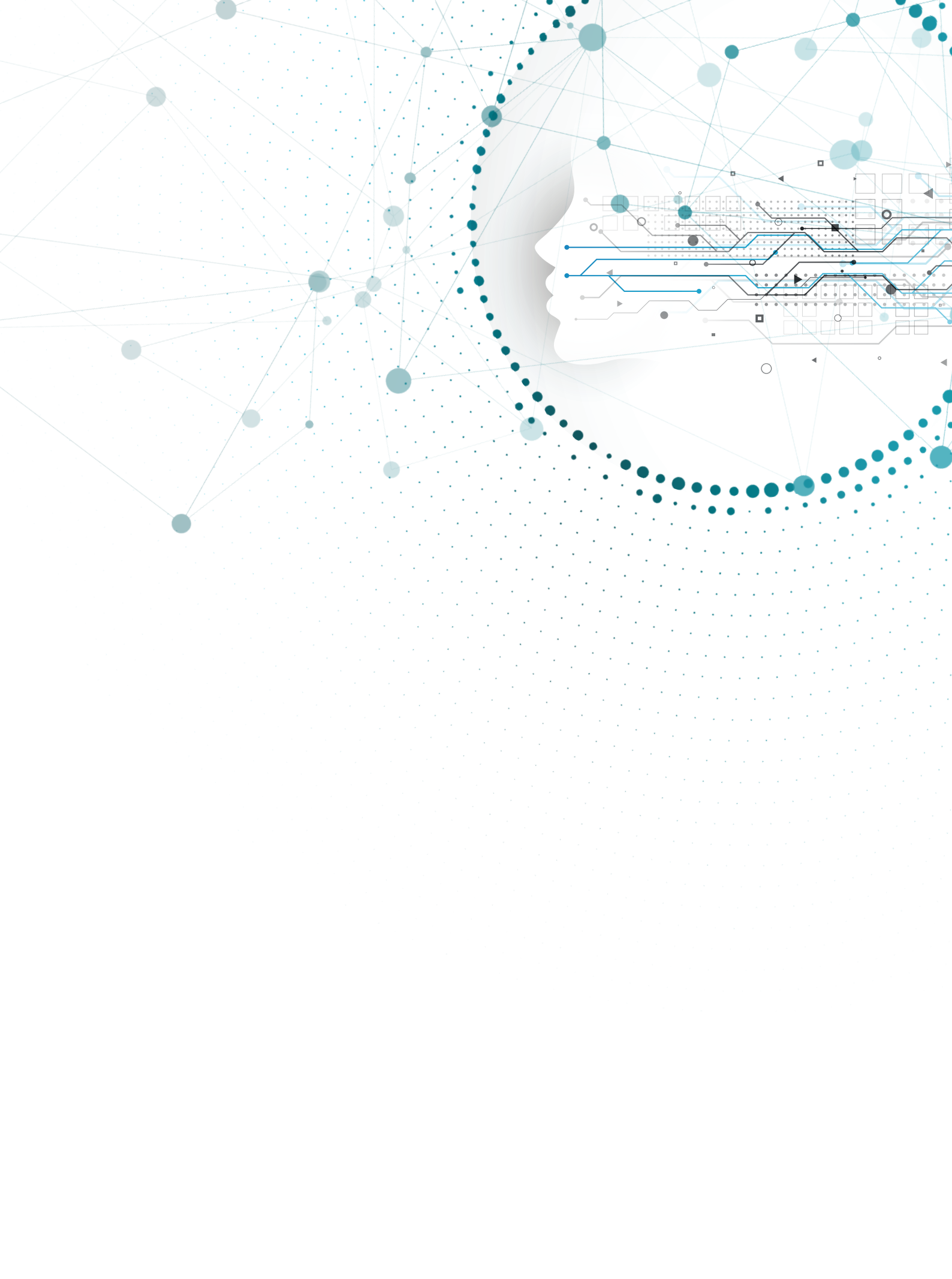
- Sporadic physical security breaches and theft of mobile assets.
- Lack of accountability and effective consequence management.
- Crime, including assets stolen at private properties (vehicles and residential areas).
- Inefficient and ineffective assets management as part of employee disengagement process.
- Loss of assets during office movements.
- Lack of tracking and monitoring for shared assets.

Key mitigation initiatives:

- Improvement of the consequence management process for assets losses.
- Implementation of a mobile asset management framework.
- Development of a process to support framework implementation.
- Implementation of an asset tracking solution with a remote wipe capability.
- Implementation of the Enterprise Service Management Solution (ITSM Tool) to better manage and log calls and allow for the association of all ICT assets with individuals in the organisation.

Risk appetite and tolerance level:

The risk is outside the tolerance level as it falls outside the organisation's policy of zero tolerance for asset losses due to theft.







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