

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

The final STI Decadal Plan and the next steps

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3 November 2023

M Making sure it's possible



science & innovation

Department:
Science and Innovation
REPUBLIC OF SOUTH AFRICA



Purpose of the presentation

The presentation seeks to update the Portfolio Committee on STI on progress, related to the following:

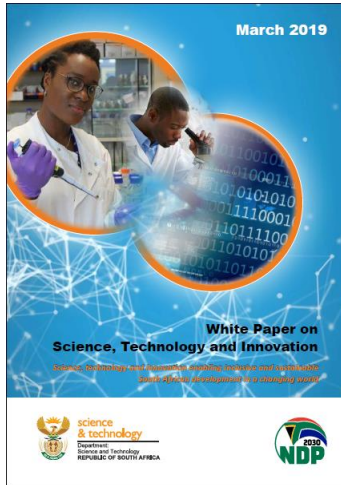
- The implementation highlights of the Decadal Plan thematic priorities in partnership with other departments
- The Innovation and Skills Compact
- The updated Strategic Management Model for STI
- STI Public Budget coordination process

Summary of Decadal Plan thematic priorities

Societal Grand Challenges	<ul style="list-style-type: none">• Climate change and environment sustainability• The future of education, skills and work• The future of society
Modernising sectors	<ul style="list-style-type: none">• Agriculture• Manufacturing• Mining
New sources of growth	<ul style="list-style-type: none">• The Digital Economy• The Circular Economy
Large research and innovation programmes	<ul style="list-style-type: none">• Energy• Health
Research and innovation for a capable state	<ul style="list-style-type: none">• Improved decision making• Improved service delivery

The Circular Economy

- The circular economy is recognized by the South African government as a new source of economic growth for a re-industrialised, modern South African economy.
- Four underlying Circular Economy Thrusts in the Decadal Plan:
 1. Reducing, reusing and recycling waste
 2. Ensuring sustainable water, energy and food (agriculture) security
 3. Low-carbon and climate-resilient economy
 4. Smart connectivity and mobility in communities



Circular Economy: Updates

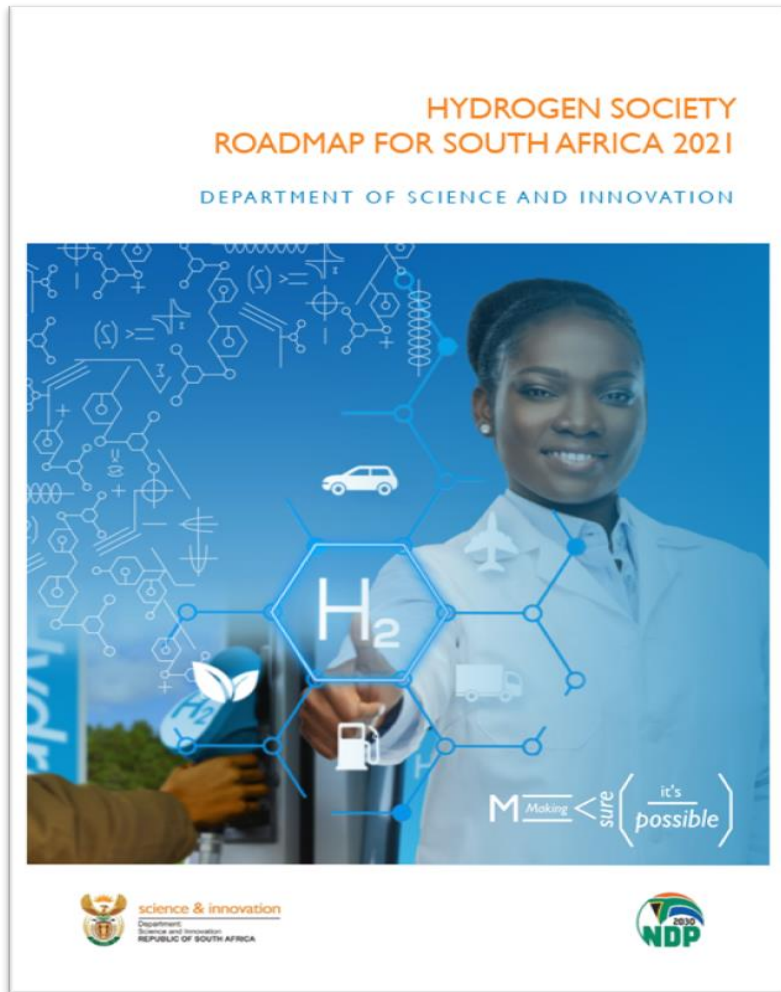
- The DSI is developing an STI-led CE strategy, as part of the development of the National Circular Economy Strategy
- **An Inter-Governmental Committee has been established to guide the STI4CE Strategy, including the DSI, DMRE, DHS and DWS.** This will enable a strong partnership between government departments to drive the circular economy in the country.
- Circular Innovation SA is an initiative of the DSI hosted by the CSIR.
- Circular Innovation SA is aimed at supporting South Africa's transition to a more circular economy through science, technology and innovation
- The DSI has launched a Circular Economy Demonstration Fund, in partnership with universities, science councils and industry. The first call for proposals issued in June 2023 – contracting is underway to support eight projects to the value of R22m.

Support for alternative building technologies

Two innovation initiatives launched on:

- 3D Printing for the construction of houses, with a pilot project site in Umhlathuze Municipality, KZN
- STI for Sustainable Human Settlements Roadmap with identified innovations such as the following:
 - Digitization of the application process for housing subsidies and rental accommodation
 - The use of plant material to make eco-friendly concrete
 - The use of recycled plastic waste to make building materials that meet industry standards

The Hydrogen Society Roadmap (HSRM)



<https://www.dst.gov.za/index.php/resource-center/strategies-and-reports/3574-hydrogen-society-roadmap-for-south-africa-2021>



Vision

An inclusive, sustainable and competitive hydrogen economy by 2050 with the goal of achieving a Just and inclusive net zero carbon economic growth for societal wellbeing by 2050.



Purpose

To align stakeholders on a common vision on hydrogen related technologies in order to create an environment where investment decisions can be made to unlock the social economic benefits for the country.

Applications of the Hydrogen technology



1 Military Hospital Deployment August 2020



South African Post Office Fuel Cell powered scooters, 2019



Impala Platinum Fuel Cell powered forklift 2016

High-level outcomes of the HSRM

The implementation of the HSRM is expected to contribute to the goal of a just and inclusive net-zero carbon economic growth for societal wellbeing by 2050 through the following high-level outcomes:



Green and enhanced power sector and buildings

[16]

Lead Department: DMRE
Supported by: DPWI



Decarbonisation of transport sectors: heavy duty trucks, shipping, aviation and rail

[8]

Lead Department: DoT
Supported by: DTIC, DFFE



Creation of a manufacturing sector for hydrogen products and components

[9]

Lead Department: DSI
Supported by: DTIC, DMRE, DSBD



Decarbonisation of energy intensive industry : iron & steel, chemicals, mining, refineries, cement

[8]

Lead Department: DTIC
Supported by: DFFE, DMRE, DPE



Creation of an export market for green hydrogen and green ammonia

[9]

Lead Department: DTIC
Supported by: DIRCO, NT



Transition from grey to blue to green hydrogen

[20]

Lead: Presidency
Supported by: DSI, DMRE, DTIC, DIRCO, DFFE, DPE, DPWI

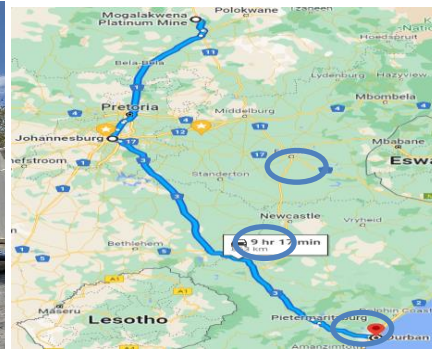
Ensure that Gender, Equality and Social Inclusion (GESI) are at the core of the transition to a low carbon economy to tackle the triple challenges of poverty, inequality and unemployment

CATALYTIC PROJECTS FROM THE HSRM AND EXPECTED OUTCOMES

CoalCO2-X™



Platinum Valley



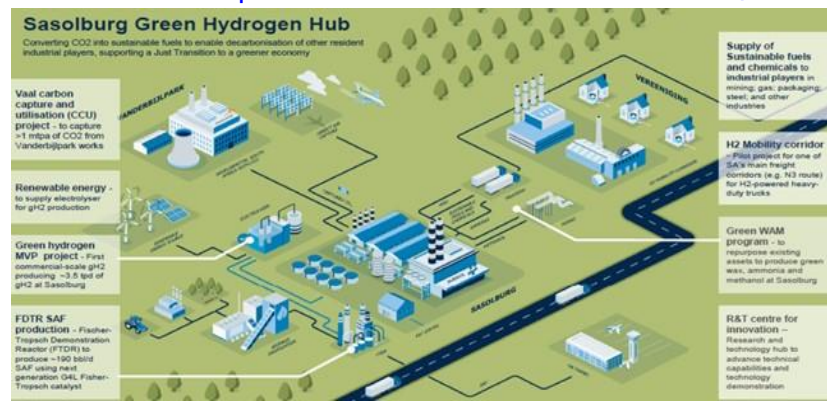
Boegoebaai SEZ



Sustainable Aviation Fuels



- Coal fired flue gas conversion and use
- Local production of fertiliser salts and other chemicals
- Technology demonstrated at PPC Cement Plant in Jan 2023
- Capital for flue gas flow rate of 400 000 cubic meters per hour ~ZAR 1.2bn.
- GH2 production & application hubs
- Decarbonisation of transport
- GDP contribution: USD 3.9bn to USD 8.8bn by 2050.
- 14 000 to 32 000 jobs per year by 2030
- Investment required: USD 1.2bn.
- Green Hydrogen and Green Ammonia for domestic use and for export
- Electrolyser Park
- Solar, wind and battery Park.
- Local production of aviation fuels for domestic use and export
- Decarbonisation of the aviation sector
- Sasol Secunda as Hub
- Capital Cost required: ZAR 8bn*

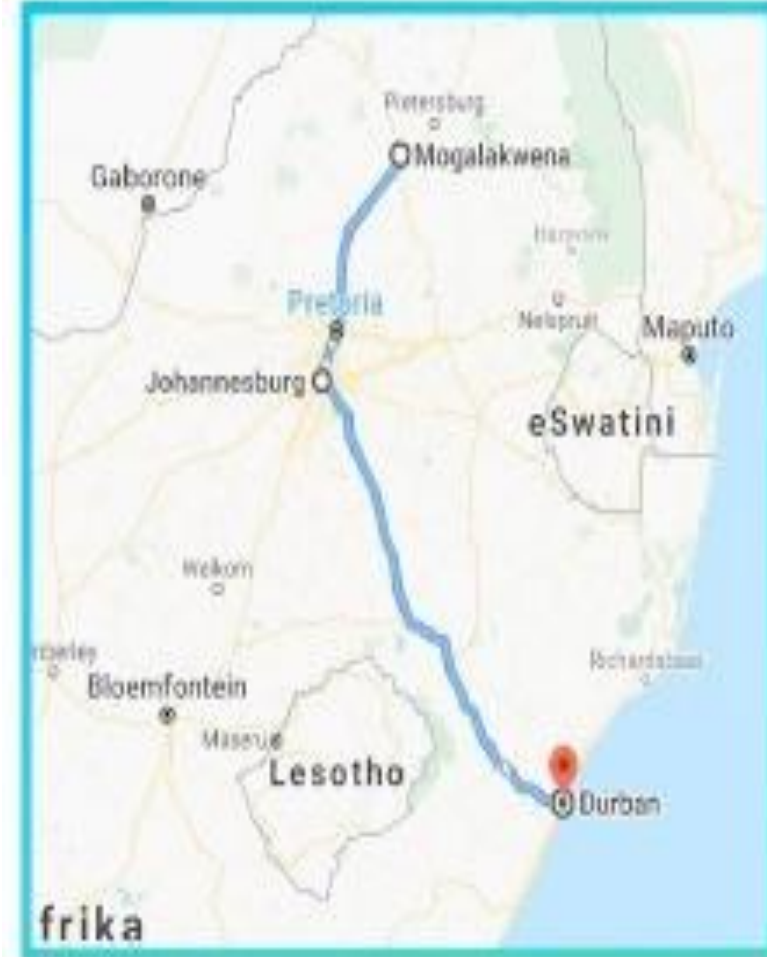


- Carbon dioxide capture from Vanderbijlpark steel plant
- Sustainable carbon for aviation fuels production
- Research & innovation centre for technology testing and validation
- Resuscitation of mothballed Saldanha steel works
- Green hydrogen production of 105 000 tonnes per yr. for green steel
- Capital required for green steel projects: ZAR 13.2bn*

*Capital requirements as reflected in the Just Energy Transition Investment Plan (Table 7, JET-IP)

Progress on the Hydrogen Valley

- The main focus of the Hydrogen valley is the conversion of heavy duty diesel trucks from diesel to hydrogen and fuel cell power in order to reduce emissions:
- Project supported by Infrastructure South Africa for registration as a Strategic Infrastructure Project (SIP)
- Hydrogen and fuel cell truck launched by Anglo American Platinum at Mogalakwena Mine in May 2022
- Collaboration with the Japanese partners on Green Hydrogen and Green Ammonia production under SATREPS initiated with North West University and Sasol as the lead South African Partners



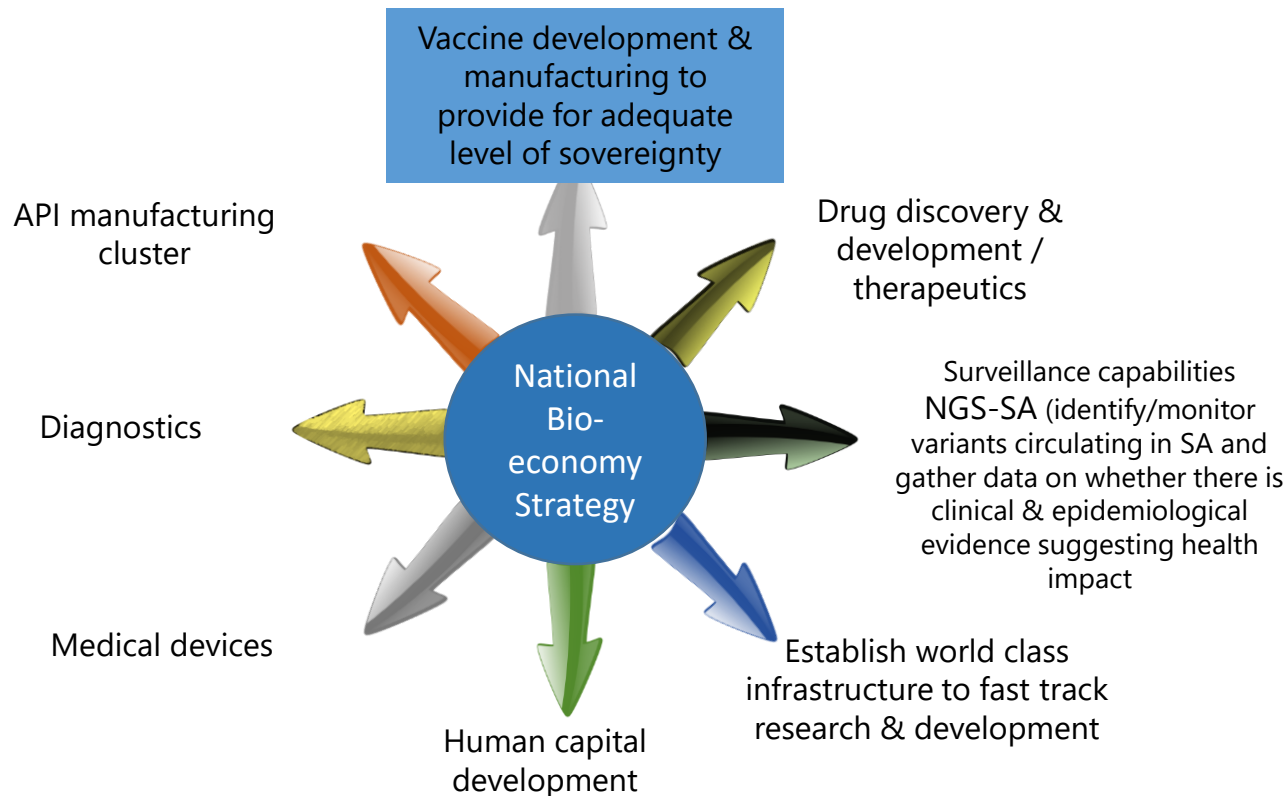
Modelling potential employment impacts of green hydrogen in South Africa

The four quantitative scenarios on employment creation through the South African TVET ecosystem highlight the policy options and impacts of the future Green Hydrogen Economy (GHE):

- ❑ **Business as Usual:** Focuses on platinum group metals (PGM) exports only, with no additional beneficiation. It also does not include additional elements of a GHE. GHE PGM mining jobs to be gained will surpass coal mining jobs lost from about 2045 onwards in all four quantitative employment scenarios.
- ❑ **Value Added Manufacturing:** Focuses on PGM exports as well as PGM beneficiation into fuel cell and electrolyser components for export, with no domestic hydrogen utilisation.
Results:
 - 1.1% growth in the South African economy by 2050
 - 16 600 TVET jobs in GHE related sectors.
- ❑ **Status Quo with Domestic Hydrogen Use:** Focuses on PGM exports with domestic hydrogen utilisation, but with no hydrogen-derived exports.
Results:
 - 2.8% higher GDP compared to the Business as Usual
 - 11 000 TVET jobs in GHE related sectors
- ❑ **All-inclusive Portfolio:** Considers domestic hydrogen utilisation options (including in mobility and power generation), as well as a portfolio of exports (including fuel cells, electrolysers, green hydrogen and ammonia, green iron and steel, and green jet fuel). The results from the impact of the combination
Results:
 - Net benefit to the economy of 11.4% of GDP.
 - 1.36 million TVET jobs for the entire economy by 2050
 - 99 200 TVET jobs in GHE related sectors.

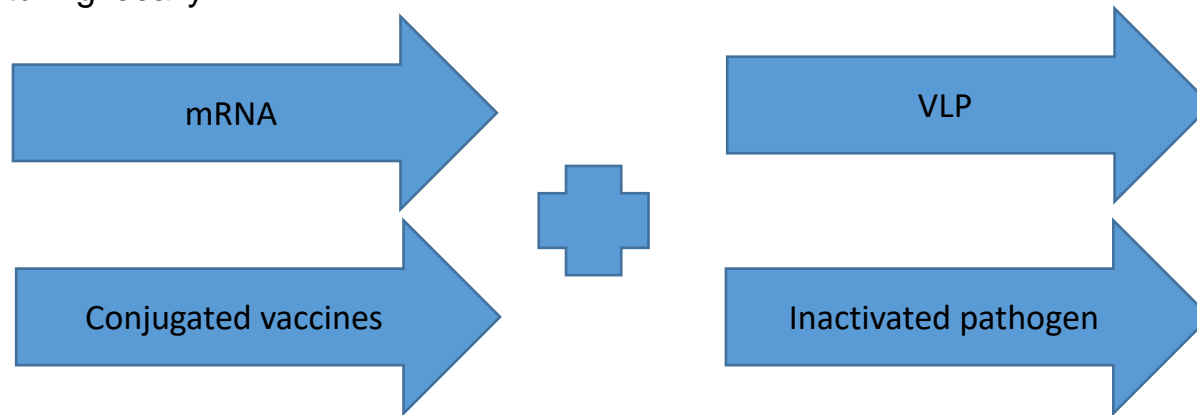
Components of the vaccine manufacturing programme

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



Priority Technology Platforms

As informed by existing capabilities, four technology platforms identified to drive vaccine research, development and manufacturing locally



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

A **National Vaccine Development and Manufacturing Strategy** being developed to (i) building local capacity & capabilities for vaccines manufacturing, building strategic national competencies in biologics, research and innovation and ensure security of supply of vaccines locally and regionally, building a critical mass of human capital and manufacturing technology, and contribute towards AU plans to increase capacity in manufacturing vaccines to be used on the continent from 1% to 60% by 2040

ADDITIONAL VACCINES

Table 3: Table showing examples of vaccines that are **mRNA, inactivated, VLP and Cuban vaccines.**

COMMERCIAL VACCINES	DISEASE	VACCINE TECH PLATFORM	MANUFACTURER
Spikevax vaccine and TAK - 919	COVID-19	mRNA	Moderna and Takeda
Comirnaty vaccine			Pfizer/ BioNTech
Curevac: CVnCoV			unsuccessful
Sanofi Pasteur: MRT5500			
Imperial: LNP-nCoVsaRNA			
Vaxigrip	Influenza	Inactivated Pathogen	Sanofi Pasteur
Tetavax	Tetanus toxoid		Sanofi Pasteur
Imovax	Rabies		Sanofi Pasteur,
Ticovac	Tick-borne encephalitis		Pfizer
Typhim Vi	Typhoid		Sanofi Pasteur
Energix	Hepatitis A	VLP	GlaxoSmithKline
Gardasil	Human papillomavirus (HPV)		Merck
Soberana 1 Soberana 2 Soberana Plus Abdala Mambisa (needle-free vaccine)	COVID-19	Protein subunit	Finlay Institute in Havana Cuba's Center for Genetic Engineering and Biotechnology

Researchers have been studying mRNA vaccines for decades, with the first emergency authorization for COVID-19.

Moderna's CDMO, Lonza has an operational cost of \$76 million with a staff of 60-70 employees dedicated to each production line (3 in total).

15
KEY

mRNA	Inactivated pathogen
VLP	Protein subunit

Expenditure on EPN vaccines in the South African healthcare system*

VACCINE	SUPPLIER	QUANTITY	PRICE	TOTAL COST
Cervarix	GSK Biologicals	3,405,900	R322.10	R1,097,040,390.00
Hexaxim	BIOVAC	19,564,650	R320.57	R6,271,839,850.50
Bacille Calmette-Guérin (BCG) vaccine	Biological and Vaccines Insitute (BIOVAC)	1,164,560	R81.17	R94,527,335.20
RV (2) Rotavirus vaccine	GSK Biologicals	9,782,320	R117.88	R1,153,139,881.60
Heberbiovac HB	BIOVAC	619,550	R98.37	R60,945,133.50
Prevenar13	Biological and Vaccines Insitute (BIOVAC)	14,673,480	R236.73	R3,473,652,920.40
Measbio	Biological and Vaccines Insitute (BIOVAC)	2,068,260	R128.74	R266,267,792.40
Tetavax	Cipla Medpro	1,858,650	R73.40	R136,424,910.00
Diftavax	Sanofi Pasteur	1,858,650	R173.60	R322,661,640.00
Grand Total				R12,876,499,853.60

**Note: GSK, Sanofi are Multinationals and BIOVAC local supplier
BIOVAC generally plays in the Fill Finish and local Importer space**

*** As per the HP-16 2020 EPI Contract Circular.**

South African Vaccine Market Analysis

- Current price set by seller and tender process used to negotiate best price
- Where number of suppliers is limited e.g., HPV vaccine, the price is high relative to cost of manufacture
- Proposing SA manufactured vaccines (catalytic projects) priced at Cost + agreed margin
 - New pricing model – opportunity to develop a new and appropriate economic model for local health products in line with the country's aspirations for increasing access to health through National Health Insurance while building a new industrial base dominated by local innovative SMEs as suppliers in the local value chains ecosystem (Entry point for start-ups)

VACCINE	PLATFORM	SUPPLIER	QUANTITY	PRICE	TOTAL COST
Cervarix	VLP	GSK Biologicals	3,405,900	R322.10	R1,097,040,390
Gardasil	VLP	Merck	273,636	R1099.00	R300,972,236
Hexaxim	Inactivated	BIOVAC	19,564,650	R320.57	R6,271,839,850
BCG vaccine	Live Attenuated	BIOVAC	1,164,560	R81.17	R94,527,335
Rotarix Rotavirus vaccine	Live Attenuated	GSK Biologicals	9,782,320	R117.88	R1,153,139,881
Heberbiovac HB	Recombinant	BIOVAC	619,550	R98.37	R60,945,133
Prevenar13	Inactivated	BIOVAC	14,673,480	R236.73	R3,473,652,920
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Tetavax	Inactivated	Cipla Medpro	1,858,650	R73.40	R136,424,910
Diftavax	Inactivated	Sanofi Pasteur	1,858,650	R173.60	R322,661,640
Grand Total					R13,177,225,817

The RED highlights indicate the Catalytic projects (to be piloted using VLP based on economic and public health priority modelling, including building infrastructure for a wider portfolio of health innovations / products)

Estimated expenditure on EPI Vaccines in SA public sector. Estimate only includes public sector but is enough to establish commercial viability of the vaccine manufacturing sector. This is further enhanced by the boundary effect on the entire health economy (vaccine ecosystem shares same infrastructure required by other high-value health products)

Task team on procurement of locally produced pharmaceuticals

DG's of DSI, NDoH, DTIC and NT met on 2 May 2023 to discuss:

- the sustainability of local pharmaceutical manufacture;
- the lack of a coherent and co-ordinated policy across government to support and enable a viable vaccine manufacturing capacity in South Africa.
- setting up an interdepartmental task team to address the above

DSI

- DDG: Socio-Economic Innovation Partnership (Chairperson)
- aDDG: Technology Innovation

DTIC

- CD: Chemicals, Cosmetics, Plastics & Pharmaceuticals
- Dir: Pharmaceuticals

NT

- CD: Health and Social Development
- CD: Economic Services

NDoH

- CD: Sector Wide Procurement

Mandate

- Develop an appropriate policy framework for vaccine manufacture capabilities and pandemic preparedness;
- Explore the levers that could be applied.

Main areas: Local procurement of pharmaceuticals

- Identify a range of instruments and interventions across government to support local pharmaceutical production in the short-to-long term.
- Analyse the Procurement Amendment Bill and make recommendations on how the Bill could give effect to the above.
- Evaluate the benefits of local production of vaccines:
 - the impact on industrialisation (job creation, higher incomes, multipliers and spillovers), skills development, technology development and transfer; and
 - a reduction in the trade deficit and other benefits such as security of supply.
- International benchmarking wrt preferential procurement and other incentives/enablers.
- Propose mechanisms to assist local manufacturers to access markets to ensure sustainability.
- Cost premium and incentives needed to protect the local industry (update 2008 IDC report).

Policy Linkages: Agricultural bio-economy



Agenda 2063

STISA 2024

Economic Recovery Plan (EERP)
New opportunities, expanded markets, jobs, SMME development)

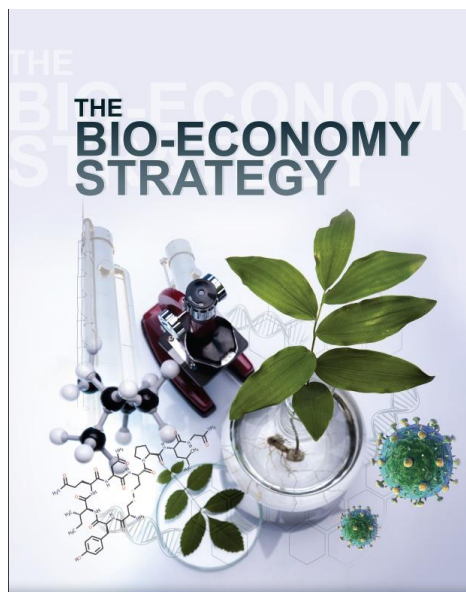


Decadal Plan

- Modernising productive sectors
- inclusivity, transformation, partnerships, creativity,
- Learning,
- entrepreneurship

AAMP Focus areas:

- Support for food security, inclusive growth, job creation, and export growth;
- Markets expansion and market access.
- Comprehensive farmer support, R&D and extension services;
- Creating enabling infrastructure and trade facilitation; and
- Localised food, import replacement and expanded agro-processing
- Approved by Minister Didiza – May 2022.



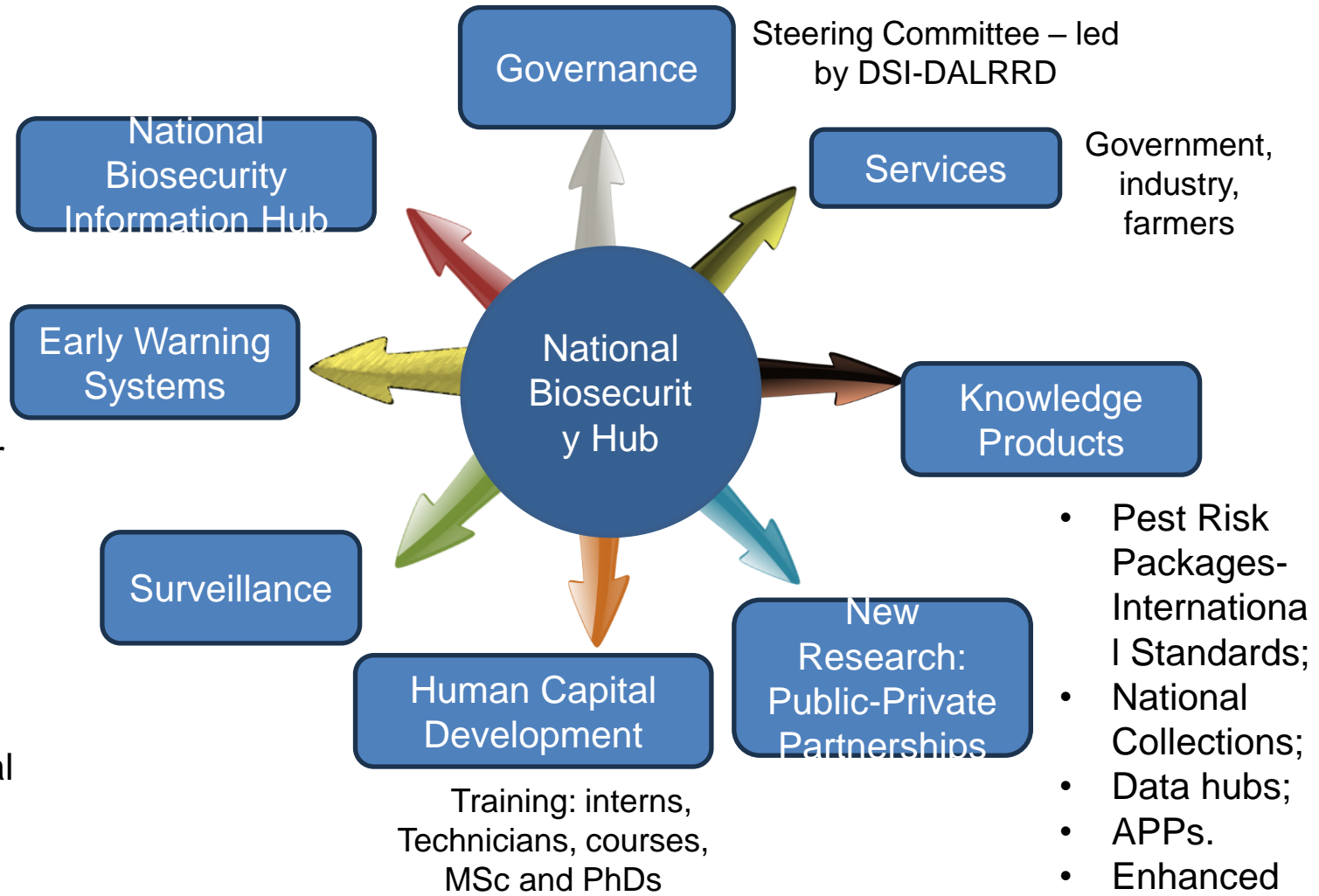
- Cabinet, 2013
- Socio-economic impact
- Prototypes and products
- Value chain approach
- Coordination
- Start-ups
- jobs

The National Biosecurity Hub

Surveillance and early warning:

(Climate Change - Plant and animal Health, Food Safety)

- identify/monitor new species circulating in SA.
- Big data/predictive models
- Epidemiological studies.



- Pest Risk Packages- International Standards;
- National Collections;
- Data hubs;
- APPs.
- Enhanced regulation



Launch of the National Biosecurity Hub

• Successful launch on 11 October 2022



Minister
Dr Blade Nzimande

Invitation

Launch of the National Biosecurity Hub

11 October 2022
10:00 – 14:00

Future Africa Auditorium and Zoom



Minister
Ms Thokozile Didiza

The Minister of Higher Education, Science and Innovation, Dr Blade Nzimande, and the Minister of Agriculture, Land Reform and Rural Development, Ms Thokozile Didiza, will launch the National Biosecurity Hub in collaboration with the University of Pretoria (UP). The hub, which will facilitate collaborative efforts in the national system of innovation to support the prevention, reduction and management of crop and animal disease and other matters related to food safety in South Africa, will be coordinated by Innovation Africa at UP. Comprising industry, academia, science councils and government role players, the hub will contribute to sustainable agricultural production and the safe trade of agricultural products, services and processes.

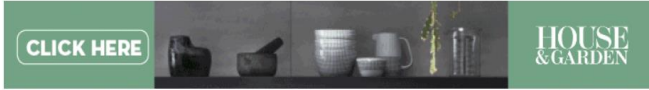
Register in advance for this webinar:
https://us06web.zoom.us/join/register/WN_t2Xf2RO-QXau9mKvRAXog

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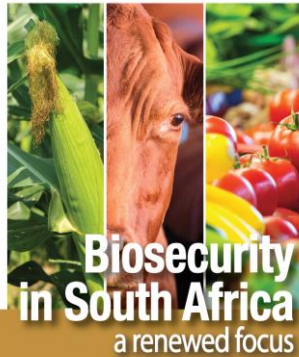
[BUSINESS REPORT](#) [ECONOMY](#)

Agricultural industry representatives welcome launch of Biosecurity Hub





NATIONAL BIOSECURITY HUB



Plant Health Animal Health Food Safety

E- Journal : Commitment to a renewed focus

farmer's weekly

News Business Animals Crops Farm basics Technology Lifestyle Auctions Classif

Home > News > Establishment of National Biosecurity Hub widely welcomed

Establishment of National Biosecurity Hub widely welcomed

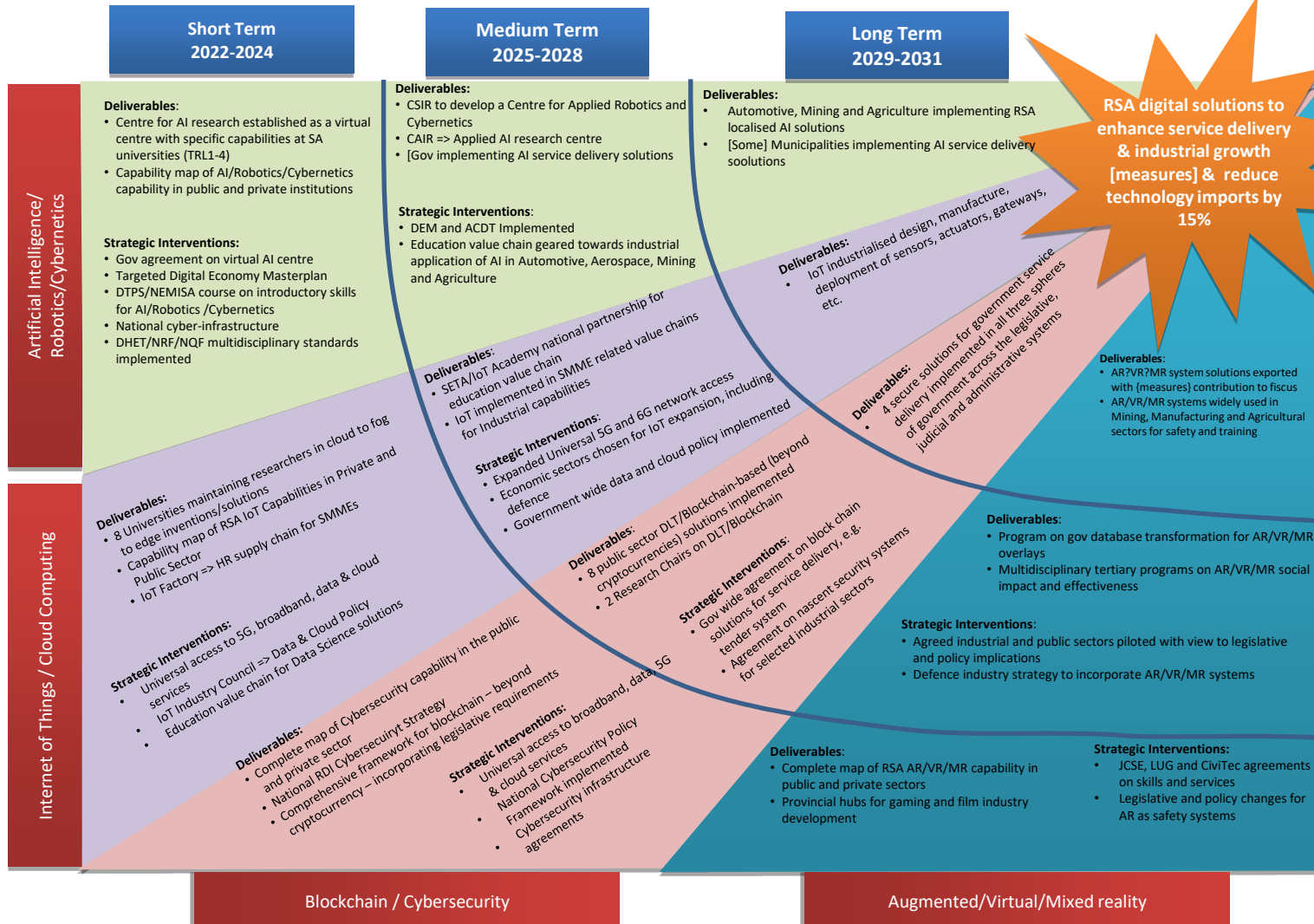
Susan Marais | 12 October 2022 | 2:28 pm

Stakeholders in the agriculture sector have welcomed the establishment of South Africa's new National Biosecurity Hub.



Foundational Digital Capabilities

Foundational Digital Capabilities - Decadal Plan



RSA digital solutions to enhance service delivery & industrial growth [measures] & reduce technology imports by 15%

ICT Domains and Specific Skills Requirements

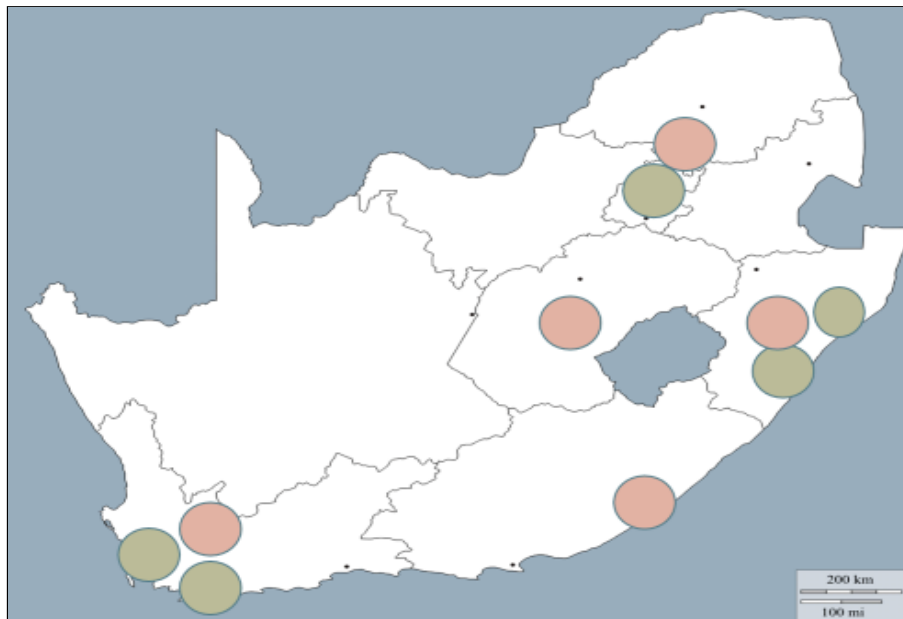
FOUNDATIONAL DIGITAL DOMAINS

- Intelligence/Robotics/Cybernetics
- Augmented/Virtual/Mixed Reality
- Modelling and Simulation
- Block Chain & Cybersecurity
- Internet of Things/Cloud Computing

SPECIFIC SKILLS REQUIRED

- Artificial Intelligence/Robotics/Cybernetics
- Augmented/Virtual/Mixed Reality
- Modelling and Simulation
- Block Chain & Cybersecurity
- Internet of Things/Cloud Computing

Collaboration on Foundational Digital Capabilities



● Main Centres: SU, CPUT, Wits, UKZN and UZulu

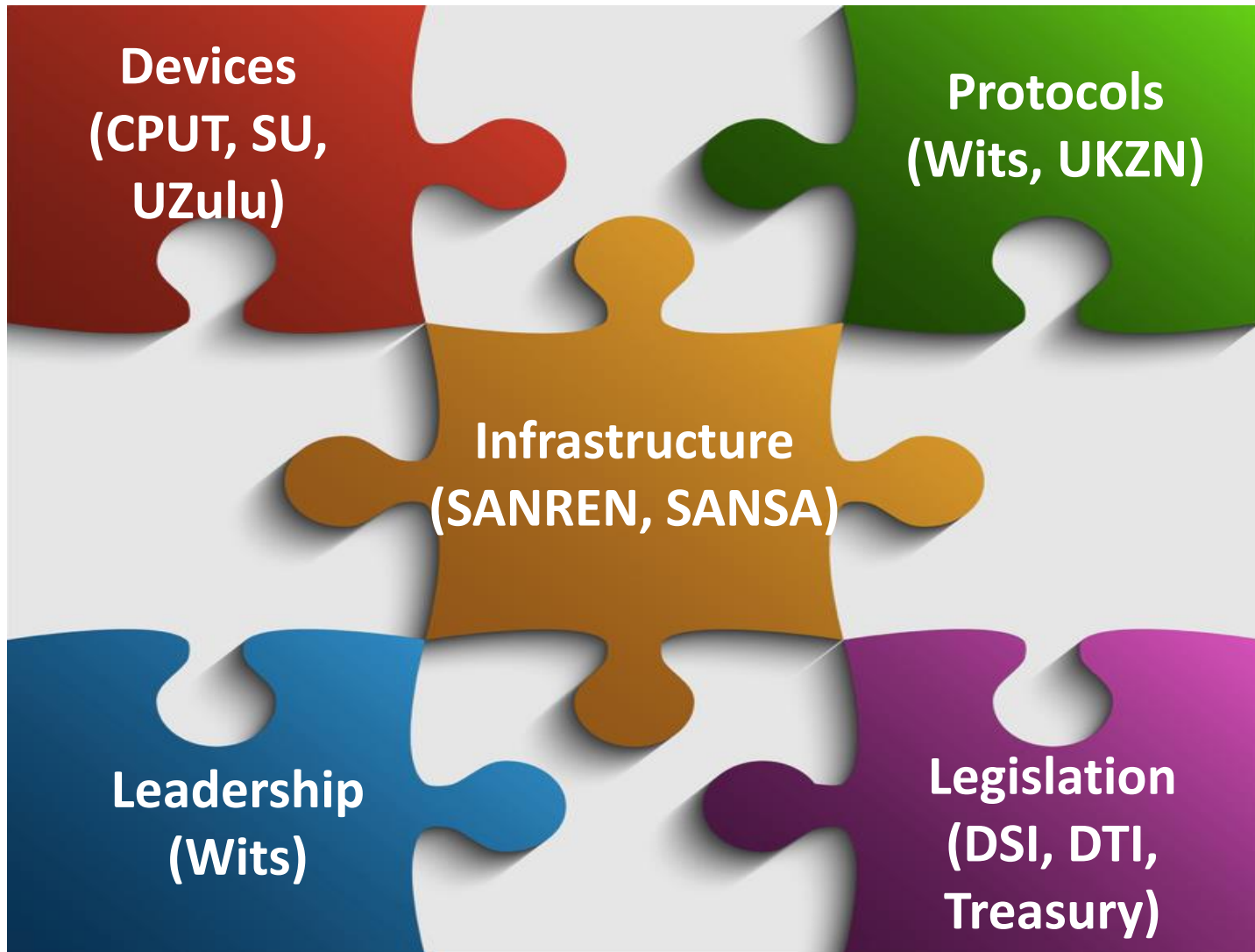
● Partner Centres: Nationally and beyond HEIs

Collaborating centres and institutes



Diverse and inclusive

Role clarification w.r.t. Foundational Digital Capabilities



Innovation Fund as a PPP driver

- Initiated in the 2018/19 FY as a **public-private funding partnership** aimed at harvesting and commercialising South African technology innovations for deployment in national and international markets.
- Exclusively focused on supporting technology innovation and commercialisation, in high-risk technology development initiatives in particular.
- The Fund is an important complementary intervention to augment the work of the Technology Innovation Agency, as well as, other government technology development programmes/initiatives.
- Encourages **private sector to co-invest** with government in technology innovation activities/initiatives through undertaking due diligence, engaging OTTs on IP to scope publicly funded IP, and leveraging of additional funds

Innovation Fund successes thus far

- As an intervention to increase private sector investment in STI
- **24 projects currently supported/funded** so far from 2020-21 with the following partners including co-investment from the private sector:
 1. SASME Fund (**5**) in bio-innovation and energy sectors
 2. PIC (**5**) also in bio-innovation and energy sectors
 3. TIA (**14**) covering bio-innovation (with a strong focus on IK-based technologies) and ICT sectors
 4. 83% of these projects were previously funded by government and now in their commercial stages
- More projects and new private sector investment envisaged in the coming years as the IF is anticipated to grow
- Investment summary in table below:

	Government/DSI Investment to IF	Private Sector Investment
IF disbursement Phases (2020/21- 2021/22)	Total	Total
Phase 1 (2020/21)	R150 million	R1,016 billion
Phase 2 (in progress)	R355.52 million	R775 million

The Innovation and Skills Compact: Context and Purpose

Context:

- The keys to a sustainable and inclusive modern economy include innovation, knowledge and skills.
- Countries across the globe with high levels of economic growth and social development purposefully manage innovation and skills at the appropriate level of government.
- The 2019 White Paper on Science, Technology and Innovation (STI) therefore called for an innovation and skills compact with a whole-of-society approach in South Africa.

Purpose:

The South African Innovation and Skills Compact is intended to enable synergistic action to develop the skills needed to drive innovation in general, and the thematic priorities of the Decadal Plan, specifically.

Skills needs identified for specific applications

- Hydrogen Society Roadmap
- Other sources of renewable energy
- South African Mining Extraction Research, Development and Innovation (SAMERDI) Strategy
- Vaccine manufacturing
- Space Science and Technology
- Mathematics, Mathematical Science / Computational Sciences
- Intellectual Property Management
- Inclusive innovation
- The development and maintenance of state-of-the-art research equipment, infrastructures and pilot plants

Economic Sector Opportunities

Existing Innovation Skills Programmes are opening up opportunities in the following economic sectors, in the main.

Gig/Platform Economy

- App development
- ICT industry job placement

Agriculture & Circular Economy

- Drone & robotics technologies
- Green technologies
- Alternative primary agricultural protocols

Energy & Water

- Renewable energy
- Water efficiency

Financial Services

- Financial inclusion
- Financial education

Education, Health & Public Services

- Improving teaching & learning in disadvantaged schools
- E-health
- Crime surveillance

Purpose of consultation with the DHET and DEL (1)

General need for policy coherence:

- Consultation held with DEL on 08th August, 2023 about a strategy for education and skills development in the STI sector to support science and innovation is to be presented to Cabinet.
- Request the input from the DHET and the DEL on their own approaches to skilling, upskilling and reskilling to develop SA's resilience in the face of a rapidly changing technologically driven future (e.g. impact of AI on traditional jobs)
- Need for coordination among role players amid numerous skills initiatives across government and institutional evolution.

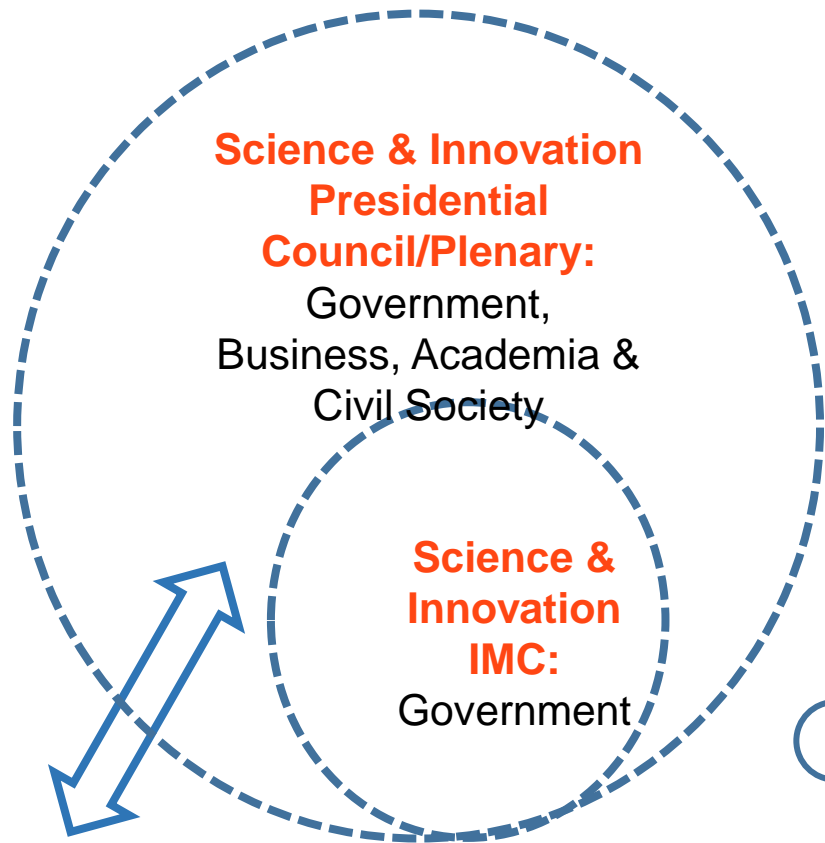


Progress on the systemic enablers of the STI Decadal Plan:

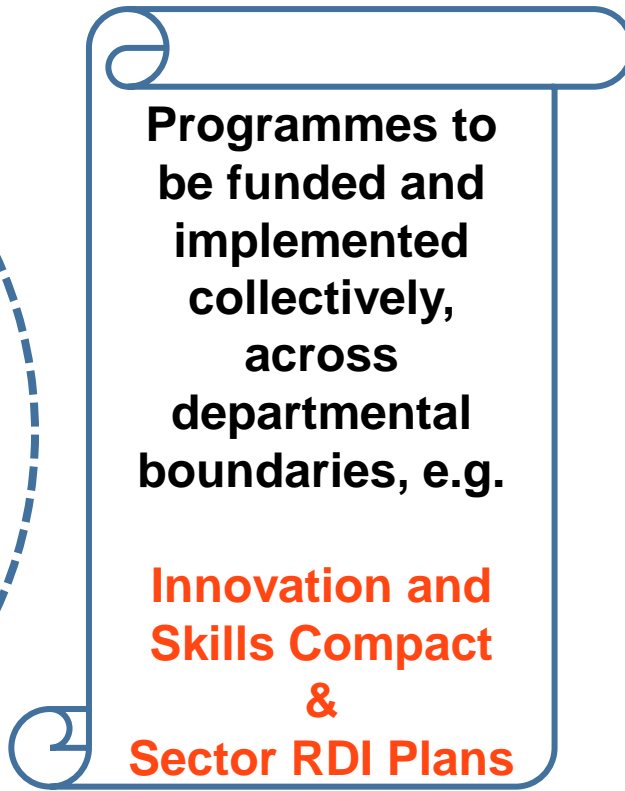
- **Public STI Budget Coordination**
- **Strategic Management Model for STI as a basis for funding**

Coherent STI governance and funding architecture

Structures for consultation & decision making



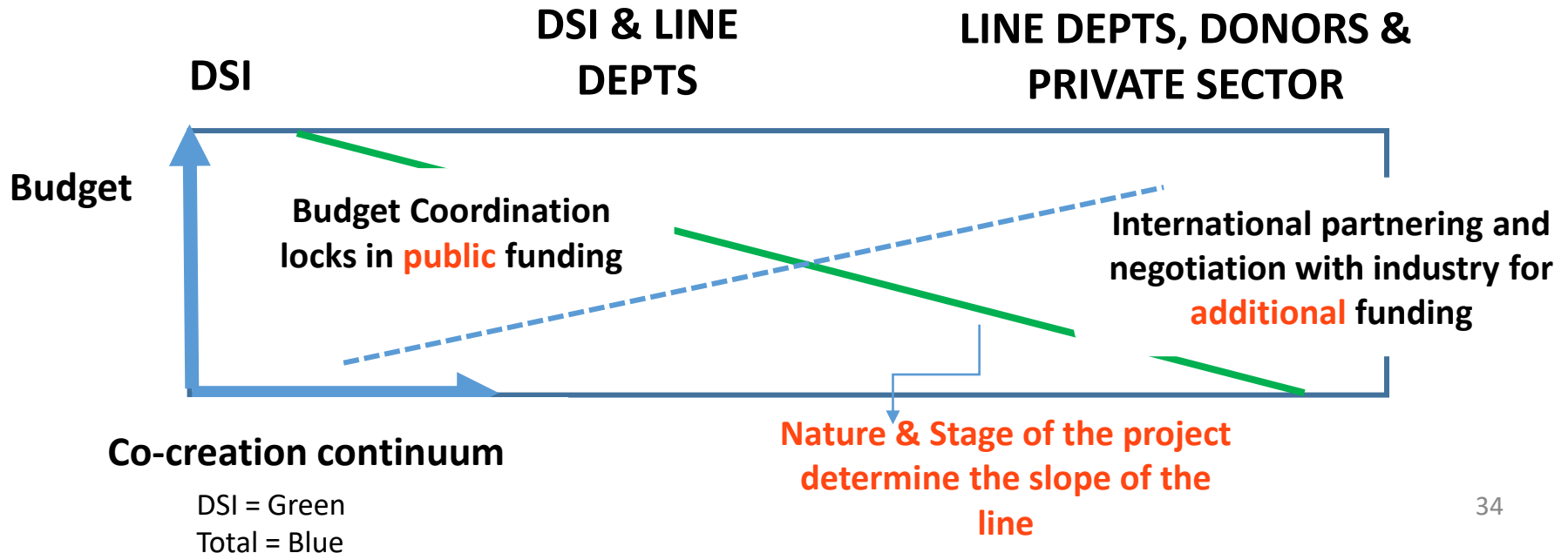
Topics for consultations



Levers to implement decisions



Decadal Plan: SMM for Science and Innovation across government & funding sources



Progress update on STI Public Budget Coordination (1)

- The IMC on STI endorsed budget coordination as part of the MTEC and DPME planning processes.
- A DSI/DPME/National Treasury Task Team has been established to phase in the integration of national STI priorities in the Budget Prioritization Framework (BPF), Medium Term Expenditure Framework (MTEF), Annual Performance Plans (APPs) and Estimates of National Expenditure (ENEs) of government departments.

Progress update on STI Public Budget Coordination (2)

- The DPME, has included STI priorities into the 2024/25 National Guideline for assessment of draft strategic plans(SP) and annual performance plans(APP), and furthermore DSI will form part of assessing departmental APPs and SP's before they are tabled in Parliament.
- As part of this capacity building to support fully integrated STI planning and budgeting, a hybrid (international/local) study of best practice in budget tagging for STI has been proposed.

The role of the DSI in the updated SMM for STI

The Ministry and DSI will function as the coordinator of the NSI, focusing on the following areas:

- Policy and strategy for STI across the NSI
- The decisions of the STI Presidential Plenary and IMC
- The allocation of macro-resources
- The promotion of system learning through M&E
- The maximisation of international cooperation and resources
- The systemic oversight of public research organisations
- The provision of human capacity and infrastructure for STI



The inaugural Presidential STI Plenary (12 December 2023)

Bi-annual Presidential STI Plenary: Draft TOR

- **Purpose:** To afford STI the required support and stature across government and society
- **Structure:** Bi-annual consultative meeting, convened by the Presidency, supported by the DSI
- **Invitees:** NSI leaders from government (IMC members), business, academia and civil society
- **Roles:** Serve as a collaborative platform for NSI partners, consider the plans and reports of the IMC on STI (on e.g. STI agenda and priority national STI initiatives, broad investment strategy, progress on priority STI initiatives), business also to present STI requirements and initiatives, joint programming and funding

Linkages between the Plenary and the IMC

PRESIDENTIAL – bringing together government, business, academia, civil society

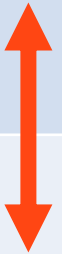
- Annual STI Plenary
- Joint reflection on NSI progress and challenges
- Recommend actions
- Joint commitment of funding

INTER-MINISTERIAL – bringing together STI-intensive departments, government clusters, National Treasury, DPME

- Enabling environment – Innovation Compact
- High-level agenda setting
- Approving Decadal Plans
- Committing public resources
- Monitoring NSI performance

DSI SUPPORT ACTIVITIES

- Strengthen NACI (capacity, processes/linkages)
- NSI M&E Function (incl. foresight capacity) @ NACI
- STI Investment Framework, integrated with National Treasury processes
- Stronger STI policy leadership role e.g. on innovation mandate of DSI, procurement, SME support, spatial footprint of innovation and linkages with relevant spheres of government, IP, support for emerging grand challenges, industries, technologies, science horizons, institutional evolution, enabling government as a facilitator for innovation



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



**science
& technology**

Department:
Science and Technology
REPUBLIC OF SOUTH AFRICA



Key Actions and Milestones

2021-2024

PRODUCTION

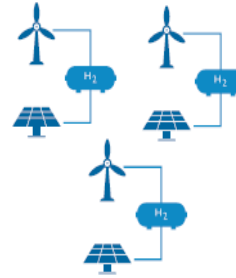
- Small scale electrolysis production
- At least 1MW GH2 production piloted



2025-2030

PRODUCTION

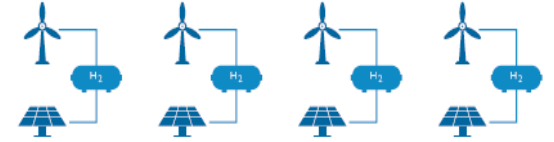
- 5GW electrolysis capacity under construction in NC
- 10GW electrolysis capacity deployed in NC by 2030
- 1.7GW electrolyser capacity deployed in H2 Valley by 2030
- At least 500kt H2 produced annually by 2030



2030-2040

PRODUCTION

- Increase electrolysis capacity to at least 15GW by 2040



USE

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



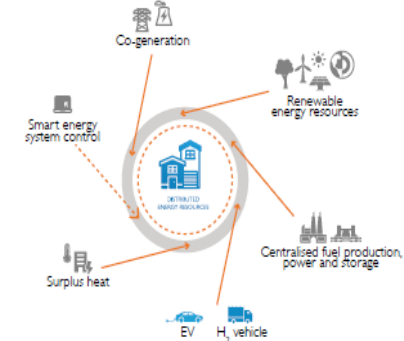
USE

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



USE

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



JOBS

- Upscaling of training and reskilling for new jobs



JOBS

- At least 20 000 jobs created annually by 2030



JOBS

- At least 30 000 jobs created annually by 2040



Establish targets and policy signals



Support demand creation



Mitigate investment risk



Harmonize standards and remove barriers



Promote Research, Development and Innovation



Strategic demonstration and deployment projects



Skills development and public awareness

VACCINES IN THE SOUTH AFRICAN HEALTHCARE SYSTEM

Table 3: Table showing estimated **expenditure on EPI Vaccines** in SA public sector as per **HP-16 2020 EPI Contract Circular**.

VACCINE	SUPPLIER	QUANTITY	PRICE	TOTAL COST
Cervarix	GSK Biologicals	3,405,900	R322.10	R1,097,040,390.00
Hexaxim	BIOVAC	19,564,650	R320.57	R6,271,839,850.50
Bacille Calmette-Guérin (BCG) vaccine	Biological and Vaccines Institute (BIOVAC)	1,164,560	R81.17	R94,527,335.20
RV (2) Rotavirus vaccine	GSK Biologicals	9,782,320	R117.88	R1,153,139,881.60
Heberbiovac HB	BIOVAC	619,550	R98.37	R60,945,133.50
Prevenar13	Biological and Vaccines Institute (BIOVAC)	14,673,480	R236.73	R3,473,652,920.40
Measbio	Biological and Vaccines Institute (BIOVAC)	2,068,260	R128.74	R266,267,792.40
Tetavax	Cipla Medpro	1,858,650	R73.40	⁴⁴ R136,424,910.00
Diftavax	Sanofi Pasteur	1,858,650	R173.60	R322,661,640.00
Grand Total				R12,876,499,853.60

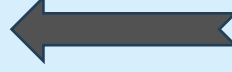
**Note: GSK, Sanofi are Multinationals and BIOVAC local supplier
BIOVAC generally plays in the Fill Finish and local Importer space.**

South African Vaccine Schedule

TB



Hep B



HPV



Vaccine schedule in South Africa

The national expanded program on immunization (EPI) schedule in use in 2016 is shown below. Multiple other schedules are available from private providers. A comparison of private South African schedules used in 2016 is given in appendix B.

National EPI schedule in South Africa, December 2015

Age	Vaccine Name	Abbreviation (Dose number)
Birth Vaccines	Oral polio vaccine Tuberculosis vaccine (Bacille Calmette-Guerrin)	OPV (0) BCG
6 weeks	Oral polio vaccine Rotavirus vaccine Diphtheria-tetanus-acellular pertussis-injectable polio- <i>Haemophilus influenzae</i> b- Hepatitis B vaccine Pneumococcal conjugate vaccine	OPV (1) RV(1) DTaP-IPV-Hib-HepB (1) PCV (1)
10 weeks	Diphtheria-tetanus- acellular pertussis-injectable polio- <i>Haemophilus influenzae</i> b-hepatitis B vaccine	DTaP-IPV-HIB-HepB (2)
14 weeks	Rotavirus vaccine Diphtheria-tetanus- acellular pertussis-injectable polio- <i>Haemophilus influenzae</i> b-hepatitis B vaccine Pneumococcal conjugate vaccine	RV(2) DTaP-IPV-Hib-HepB (3) PCV (2)
6 months	Measles vaccine	Measles (1)
9 months	Pneumococcal conjugate vaccine	PCV (3)
12 months	Measles vaccine	Measles (2)
18 months	Diphtheria-tetanus- acellular pertussis-injectable polio- <i>Haemophilus influenzae</i> b-hepatitis B vaccine	DTaP-IPV-Hib-HepB (4)
6 years	Tetanus, reduced dose diphtheria vaccine	Td (1)
9 years	Human Papilloma Virus vaccine (2 doses 6 months apart)*	HPV (1) HPV (2)
12 years	Tetanus, reduced dose diphtheria vaccine	Td (2)

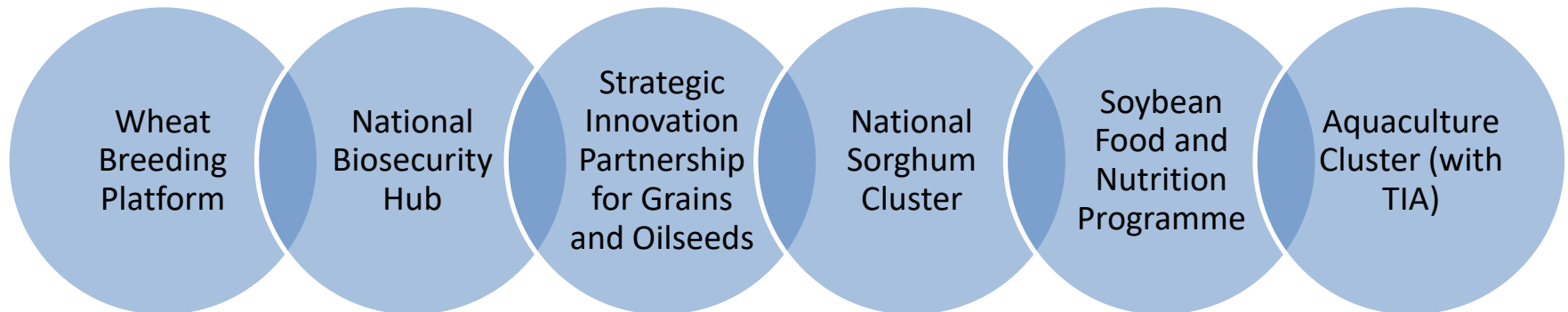
*HPV vaccine is given as part of the school health programme rather than the expanded program of immunization.

Agricultural Bio-innovation Partnership Programme (ABIPP)

Vision: A vibrant and economically sustainable agricultural sector through bio-innovative technologies, products, processes and services contributing to increased productivity, food security and rural economic development – supports the AAMP and NDP.

- **ABIPP** – instrument to implement the Agricultural Bio-economy.
- **Principles** – Inclusivity, transformation, partnerships

ABIPP FLAGSHIP PROGRAMMES:



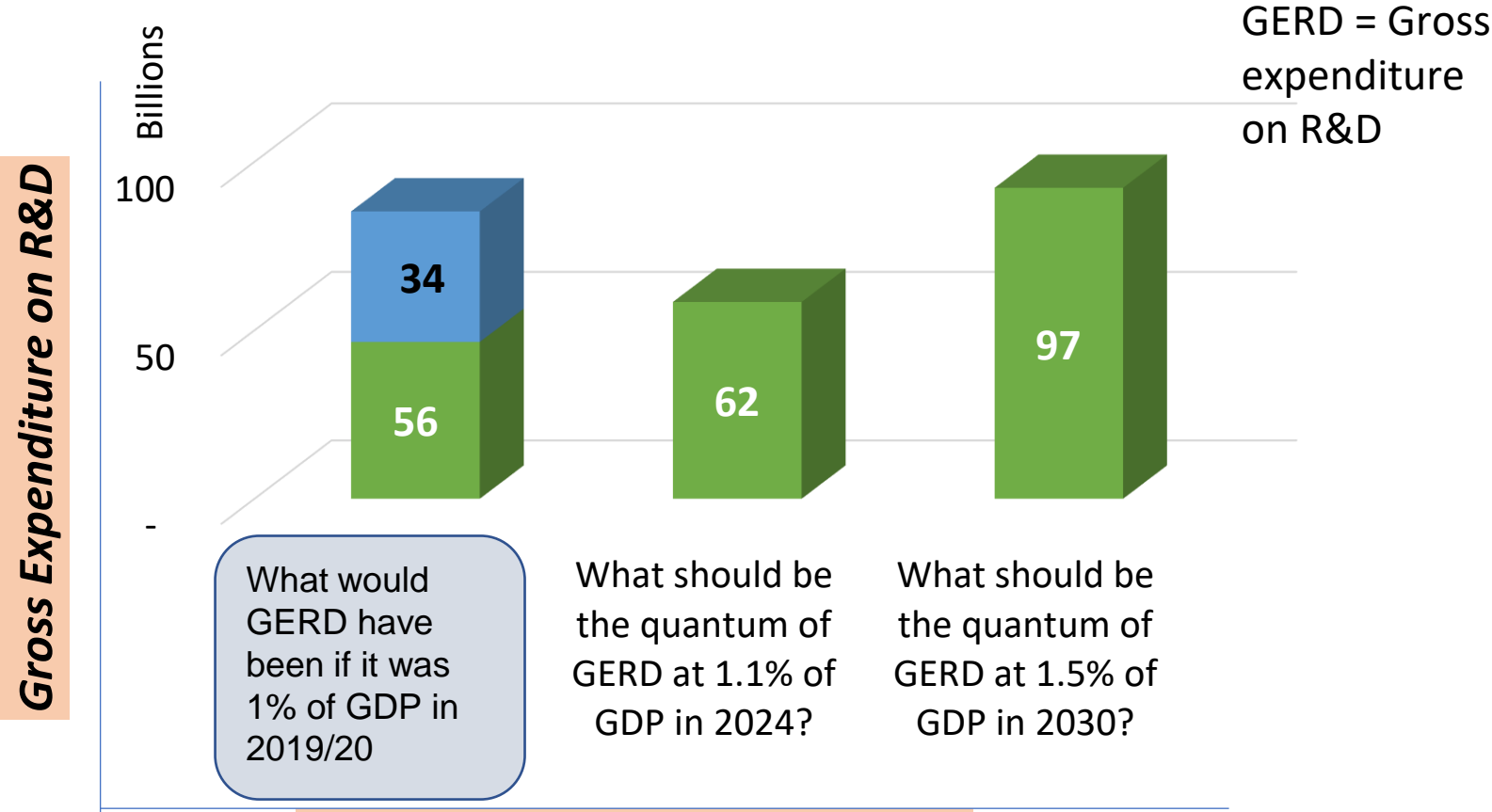
- Focus on co-funded multi-disciplinary, multi-institutional agricultural bio-innovation programmes
- New product development, New processes, including agro-processing , Services (Technology dissemination)

Purpose of the consultation with the DHET and the DEL (2)

Specific issues to be explored among the DSI / DHET / DEL:

- Expansion of the provisioning of short skills programmes (both accredited and non-accredited) to respond to the skills gaps identified in the identified innovation priority areas;
- Expansion of the provisioning of WBL opportunities to respond to the occupational shortages and skills gaps identified in the innovation priority areas;
- Increases in enrolments in qualification-based programmes that respond to the gaps identified in this strategy;
- Review and revision of education and training qualifications, programmes and curricula to respond to the identified skills gaps; and
- Implications for the identified innovation skills gaps in enrolment planning.

Context: Required GERD by 2024 and 2030



Calculations S&T Investment

■ Estimated GERD ■ Actual GERD

Updated Strategic Management Model for STI approved by Cabinet

- The revised SMM is underlain by the principle of cooperative governance across the STI value chain (instead of restricting the role of the DSI to frontier sciences)
- Steering mechanisms include the following:
 - The biennial Presidential STI Plenary
 - The Inter-ministerial Committee on STI
 - The Forum of South African Directors-General (FOSAD)
 - The government cluster system
 - The Medium-term Expenditure Committee (MTEC)
 - The Innovation Fund
 - The Innovation and Skills Compact
 - Collaboration agreements between departments

On science councils in the updated SMM

The continued reporting of different science councils to different departments may be reviewed to bring about better outcomes and impacts. The following would be useful in this regard:

- Conducting a periodic evaluation of the effectiveness of departmental representatives on the boards of science councils.
- Reinvigorating the review system for science, engineering and technology institutions to address long-unresolved problems and to provide the required support.
- Developing a framework with systematic, well-founded criteria for establishing and closing science councils, or changing their mandates.