



The NRF Industry Partnership Strategy

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1. EXECUTIVE SUMMARY

The demand for innovative solutions that respond to socio-economic challenges and opportunities has resulted in an increasing need for collaboration between industry [i.e. the private sector, State Owned Enterprises (SOEs) and SMEs] and academia (i.e. universities, national facilities, research councils and research performing entities). The National Research Foundation's (NRF) Industry Partnerships Strategy aims to, in close collaboration with industry partners, accelerate the co-creation of knowledge for i) impact of knowledge products, and ii) skills development supported by the organisation, to the broader society. The Strategy is aligned with the NRF's mandate to inter alia "support, promote and advance research and human capacity development through funding and the provision of the necessary research infrastructure, in order to facilitate the creation of knowledge, innovation and development in all fields of research". It is recognised that in order to optimally fulfil this mandate, the NRF must engage with industry, from both the public and private sector, which brings resources and experiences beyond the scope of the academic realm.

This Strategy provides direction to guide and position the NRF to play a prominent and facilitative role in promoting collaboration between industry and academia in order to increase socio-economic impact of knowledge and human capacity investments. This will be achieved by advancing the transformation of the student and researcher cohort; innovative knowledge production and funding that have potential to positively impact society; enabling broader exploitation of the knowledge produced by researchers; enhancing mutually beneficial dialogue between science and society; and improving efficiencies in the National System of Innovation (NSI) through enhanced interplay among various key actors. The Strategy focuses on three core areas:

- Developing skilled human capacity by fostering collaborative training opportunities with industry, targeted at outstanding PhD students, postdoctoral fellows, and Early Career Researchers (ECRs);
- Promotion of joint research with industry (co-creation of knowledge) that has potential to increase research impact on society and strengthen the interface between science and society;
- Fostering a culture of collaborative networks with industry in South Africa, regionally and the globe.

The NRF Industry Partnership Strategy is aligned with the White Paper on Science, Technology and Innovation (2019), which places emphasis on government-industry partnerships as an explicit policy mandate of public research institutions, particularly science councils; and that the development of these should be monitored as part of their annual performance plans. In addition, the strategy is contextualised within the NRF Vision 2030 and Strategy 2025 which aim to increase the transformative impact of the organisation on society through knowledge advancement and skills development.

This Strategy is a core component of the Strategic Partnership Strategy of the NRF, which outlines the organisation's renewed partnership approach for national and international partners and broadens the scope of partnerships outside of the traditional research domain, to encompass partnerships to advance all areas of the NRF Mandate, including its technical and operational efficiency and its impact through industry and other partners. The selection of industry partners is guided by a number of criteria, which are elucidated in the Strategic Partnerships Strategy. The criteria are significantly determined by notions of ethical research and engagement, as it relates to the values of the NRF.

2. INTRODUCTION

The NRF plays a vital role in the research enterprise across the NSI in South Africa and the region. While the organisation has successfully achieved its broader mandate of supporting research, skills development and science engagement, it needs to directly account for the impact and advancement of its investments in the broader innovation value chain. To effect this change, the NRF has to build critical engagements with industry partners, science councils, universities, and researchers that champion knowledge creation and sharing, discovery, and knowledge uptake. In this fundamental redirection, key strategic guidelines shape this approach for the future:

- The NRF's Vision 2030 and Strategy 2025 articulate the type of organisation that the NRF will strive to be within the next ten years, together with the contribution it plans to make to national development and the knowledge enterprise. Strategic focus areas for the NRF over the next decade are to shape, influence and impact the national research system; to establish itself as a thought leader and source of knowledge within the science sector; to create a clear causal relationship between research and national development; to have a transformative effect on the national research enterprise and the relationship between science and society; and to enable, initiate, facilitate and perform excellent research with direct and indirect impact, whether immediate or long-term, that extends the frontiers of knowledge and addresses national challenges.
- The NRF Research Agenda (in development) provides the common thread that ties together and integrates all of the organisation's investments in research support, research promotion, research capacity development, and science engagement. As part of its overall objectives, the NRF Research Agenda seeks to encourage research that will have the greatest possible local, regional, and international socio-economic impact, and to increase South Africa's reputation within the global science community by strengthening international scientific and technological collaboration.
- The NRF's Strategic Partnerships Strategy is cognisant of the limited resources – both financial and otherwise within the science system. For this reason, it is critical to direct and develop a partnerships strategy that will allow the organisation to strengthen its resource base, expertise and skills by actively pursuing productive partnerships with organisations, relevant government departments, industry and international organisations to garner support in key priority areas. The selection of industry partners are guided by a number of criteria, which are elucidated in the Strategic Partnerships Strategy. The criteria are significantly determined by notions of ethical research and engagement, as it relates to the values of the NRF.
- The NRF's Stakeholder Engagement Strategy represents the organisation's commitment in its ability to foster and maintain strong relationships with its stakeholders through transparency, effective communication and proactive engagement. Fundamental to the NRF's work as a transformational, knowledgeable and influential agency of Government that steers the NSI towards national and global competitiveness, is understanding and engaging with stakeholders. Industry is regarded as primary stakeholders of the NRF (those with a direct and immediate stake in the NRF or who can influence its operational environment).

The purpose of this Strategy is to guide and position the organisation to increase the flow of information, ideas, skills, knowledge and resources between academia and industry. This in turn will result in increased knowledge co-creation and uptake, increased critical skills development and transfer, and increased impact of NRF-funded research on societal challenges. The Strategy focuses on repositioning the NRF as a key player in stimulating the development of relationships between universities, research performing entities and industry, working closely with other key stakeholders in the National System of Innovation. The strategy is premised on the following three key principles:

- i. Develop skilled human capacity: The production of critical skills is one of the key strategic area of the NSI, and a prominent aspect of the NRF Mandate. Targeting new and re-purposing existing human capital development programmes that provide industry internship opportunities, the Strategy will be purposeful to (i) accelerating academic career pathways for ECRs (ii) the production of a highly skilled workforce that is capable of transferring intellectual and technical expertise to industry, and vice versa, and (iii) the provision of supervisory capacity by industry experts.
- ii. Promote collaborative research: In order to increase the uptake of knowledge products in society and industry, collaborative research programmes that use a co-creation approach in designing and implementing research are critical. The Strategy will collectively identify research programmes that will involve joint design, implementation and funding of programmes, aligned with the NRF Research Agenda. Closely integrated with the development of critical skills (human capacity as above), novel areas of research and approaches will be supported and facilitated with a variety of partners in fostering reciprocal exchange of knowledge between academia and industry, and to provide a platform for sharing high-end research infrastructure.

- iii. Facilitate national and international networks: The Strategy will guide the development of programmes that are inclusive of a networked and partnership approach among a variety of national and international partners, and leverage the NRF's convening power to promote engagement. These include a number of international business chambers in South Africa, specific science councils, and international networks with a shared intent.

3. RATIONALE

During the past two decades, Science Granting Councils across the world have increasingly realised the need for robust collaboration with industry, as a result of a number of factors, including: limited public funding, demand for increased research impact on society, and demand for skilled human resources. In addition, the growing concern for sustainably addressing socio-economic and environmental challenges has resulted in the drive to the development of challenge-based funding tools that require effective collaboration with key actors in national systems of innovation. For instance, the concept of the quadruple helix¹ highlights that the potential for innovation and socio-economic development in a knowledge society lies in a more prominent interaction between the research performers (inter alia universities), industry, government and civil society.

From an organisational perspective, there is growing need to diversify the income base, impact, as well as mechanisms to demonstrate and achieve the value of investments in research and human capital development. As a result, building key partnerships between industry and academia is essential.

3.1 AN OVERVIEW OF THE STI LANDSCAPE IN SOUTH AFRICA

The concept of the NSI defines the web of interactions in the research system between the public and private sectors that contribute to the development and implementation of new technologies. In South Africa, the government R&D funding accounts for approximately 44.6% of Gross Domestic Expenditure on R&D (GERD) and private sector accounts for 38.9%. In monetary values, this amounts to nearly R13 billion spending from the private sector, and R14.4 billion from government. A report by the HSRC² noted that levels of national R&D investments in 2015/16 decreased by almost 12% from a highest peak (i.e. 0.9% of GERD) in the 2006/2007 financial year.

Within government, SOEs are critical for economic development and if effective, form the basis of the economy while remaining efficient and internationally competitive. In South Africa, some of the key public players funding science, technology and innovation (STI) include: the Department of Science and Innovation (DSI), the Department of Trade and Industry (the dti), the Technology Innovation Agency (TIA), the Water Research Commission (WRC), the NRF, and other SOEs (Annexure 1). Important public sector role players in terms of conducting research, and who have selected industry-link research activities, are predominantly the sector-focused science councils like the Medical Research Council (MRC), Council for Scientific and Industrial Research (CSIR), the Agricultural Research Council (ARC), the Council for Geosciences, and Mintek.

A study by the former Higher Education SA (HESA now USAf) noted that some of the challenges faced by university-industry interaction in South Africa can be attributed to misalignment and non-coordination between sub-systems of the NSI, and between key agencies and actors. The study noted that effective coordination and alignment between the organisations and actors within the NSI will increase intended outcomes, with due recognition that a large number of interactions exist, but that a formalisation or 'structuring' of approaches will benefit a strategic direction for broad-based and focused engagement.

Despite the high number of public and private research and innovation actors in South Africa, the current innovation landscape is not optimally effective considering the siloed approach among the various actors towards addressing societal challenges, hindering transformative change within the NSI.

1 https://www.socialinnovationatlas.net/fileadmin/PDF/einzeln/01_SI-Landscape_Global_Trends/01_07_How-SI-Underpins-Sustainable-Development_Millard.pdf

2 <http://www.hsrc.ac.za/en/research-data/view/9205>

3.2 UNIVERSITY-INDUSTRY LINKAGES

Within the higher education sector, university-industry linkages are one of the key areas of collaborative partnerships. Opportunities exist to accelerate and upscale joint research and development (R&D), student/ job placements, academic representation on governing/ advisory boards, staff exchanges, research centres, and innovation/ commercialisation initiatives. University-industry partnerships can further enhance the impact of STI for the economy through: increased skills development, absorption of skilled talent into the labour force, and STI advancement and transfer. Through these partnerships, industry gains access to appropriate and affordable technologies and becomes more competitive in the marketplace. Conversely, universities improve their financial position and gain first-hand technological experience.

A World Bank study notes that university-industry collaboration can expand the relevance of research carried out in public institutions, foster the commercialisation of public R&D outcomes, and increase the mobility of labour between public and private sectors. The study further highlights the different types of university-industry links based on objectives, scope and institutional arrangements, as summarised in Table 1:

Table 1: Types of University-Industry Links³

High (Relationships)	Research partnerships	Inter-organisational arrangements for pursuing collaborative R&D, including research consortia and joint projects.
	Research services	Research-related activities commissioned to universities by industrial clients, including contract research, consulting, quality control, testing, certification, and prototype development.
	Shared infrastructure	Use of university labs and equipment by firms, business incubators, and technology parks located within universities.
Medium (Mobility)	Academic entrepreneurship	Development and commercial exploitation of technologies pursued by academic inventors through a company they (partly) own (spin-off companies).
	Human resource training and transfer	Training of industry employees, internship programmes, postgraduate training in industry, secondments to industry of university research staff, adjunct staff of industry participants.
Low (Transfer)	Commercialisation of intellectual property	Transfer of university-generated IP (such as patents) to firms (e.g. via licensing).
	Scientific publications	Use of codified scientific knowledge within industry.
	Informal interaction	Formation of social relationships (e.g., conferences, meetings, social networks).

3.3 CSI IN SOUTH AFRICA

Corporate Social Investment (CSI) plays an increasingly important role in the education sector in South Africa and encompass initiatives that are external to the normal business activities of a company and not directly for purposes of increasing company profit. These initiatives have a strong developmental approach and utilise company resources to benefit and uplift communities; and are not primarily driven as marketing initiatives. According to the Business Society Handbook (CSI, 2017), the total estimated CSI expenditure in 2017 was R9.1 billion. Approximately 48% of the CSI expenditure was towards education programmes (Figure 1). Of the total allocation spent on education, 31% is spent on the tertiary education sector.

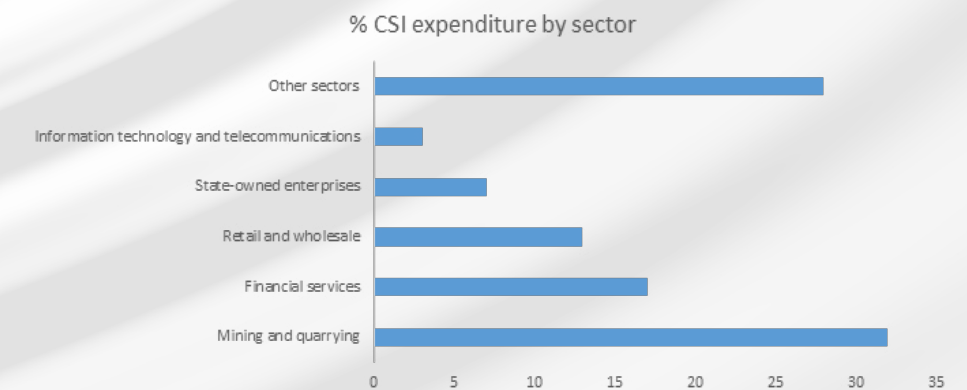


Figure 1: Distribution of CSI expenditure by sector in 2017

3 Adapted from: World Bank, 2013: Promoting university-industry collaboration in developing countries.

This presents an opportunity for the NRF to develop/ enhance its partnerships with industry partners with interest in using knowledge, innovation and skills transfer as well as those institutions willing to support the NSI through provision of resources. As evident from other countries, innovation, business competitiveness and job creation are greatly enhanced by the research conducted by inter alia universities.

As a key player within the system, the NRF is well positioned in its responsibility of research and development support in all areas of science to act as an enabler for increased cohesion among actors with a vision for an inclusive, transformed, engaged, impactful and efficient research and innovation system. Opportunities exist for the NRF to enhance its partnerships with a number of firms to collectively design targeted research and skills programmes, aligned with its Mandate (and as outlined in Table 2). This would build on existing models such as: (i) the NRF in partnership with FirstRand Foundation, which jointly supports Research Chairs and the Black Academics Programme; (ii) the Nedbank Eyethu Community Trust has been supporting Research Chairs at various institutions of higher learning; and (iii) the NRF-Sasol Foundation Partnership for Postgraduate Training. To effectively implement this Strategy, a consultative approach with various NRF divisions and other partners will be used to select partners based on a set of guiding principles.

Table 2: Alignment of Strategy with NRF mandate

Research Excellence	HCD	Research Infrastructure (RI) Platforms	Resources	Science and Society
Collaborative research for increased impact and knowledge uptake, aligned with Research Agenda	Innovative skills development and transfer through industry placements resulting in a productive economy	Joint investments in provision of RI and management, resulting in innovative and collaborative research	Increased resources through collaborations with industry (incl. SOEs, Private sector)	Increased engagement with society
Increased networks and relationships between academia and industry	Expand research networks	Increased sharing of RI Platforms with key stakeholders in the NSI and internationally	Increased networks within the NSI resources	Expanded research networks
Enhanced knowledge and technology transfer in the NSI	Increased mentorship opportunities for students and fellows	Strategic regional approaches to increase access to global RI	Increase mentorship opportunities	Increased understanding of knowledge economy products
Expand research networks	Increased postgraduate throughput through additional resources/ experience	Support of Open Science initiatives at all levels	Increased impact on the national economic landscape	Increased uptake of knowledge economy products in society
An innovative economy, e.g. through IP generation from research	Accelerating career progression of candidates and exposure to practical R&D environments	Expand research networks	A coordinated NSI	Increased interest in knowledge and innovation production

4. APPROACH

The NRF Industry Partnership Strategy focuses on supporting, promoting, and advancing research and human capital development programmes that involve long-term partnerships between industry and academia. The NRF will directly engage industry and academia with a goal to increase the responsiveness of the organisation to industry needs, mobilise resources and enhance joint programming that promote social and economic development. An overview of the proposed approach is outlined in Figure 2, aligned with the three key pillars of the strategy: i) joint research, ii) joint human capital development, and iii) increased networks, as further illustrated in the following sections. The implementation of this Strategy will be anchored on existing and new industry partnership programmes with inter alia international business chambers in South Africa, at public universities, as well as the strong national and global partnership footprint of the NRF.

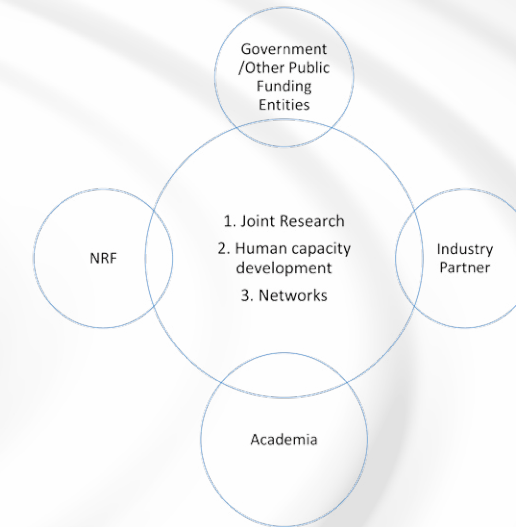


Figure 2: Illustration of proposed approaches

4.1 DEVELOPMENT OF SKILLED HUMAN CAPACITY

One of the key focus areas for the Strategy is the development of innovative human skills for PhD students, postdoctoral fellows and ECRs. The programme is aimed at bridging the existing gap between theory, practice and demand-driven skills and research in specific themes funded by the NRF and its partners. This programme will increase uptake of knowledge by industry, increase innovation within the NSI, increase baseline funding for research and skills development, increase Intellectual Property (IP) creation, develop well-rounded research specialists, expand research networks, create job opportunities, accelerate career progression of candidates through exposure to practical R&D environments. In addition, the programme will strengthen international research collaboration resulting in development of high calibre, qualified postgraduate students, postdoctoral fellows and ECRs.

This Strategy will focus on fields aligned to industry priorities and specific areas proposed by the NRF Research Agenda (i.e. Health, Smart Economy, Environment, Resource Security and Nation Building), and be aligned with existing NRF PhD and postdoctoral scholarships, and ECR programmes. At regional and global level, the programme will be aligned to the Global Knowledge Partnerships (GKP) programme, which seeks to integrate and incorporate a 3- to 18-month international experience opportunity into the research and education programmes of exceptional PhD students, postdoctoral fellows, and ECRs.

The individuals will be required to spend a percentage of their time working at the industry partner (nationally and abroad) in order to build the networks and skills necessary for increased innovation. The proposed approach is outlined below and illustrated in Figure 3.

National placements: Placement of successful candidates in local industries (including private sector, SOEs, NGOs) and Government departments as part of their existing programmes. This programme will be achieved by:

- Developing customised NRF programmes aligned with the Research Agenda that directly support placement of students, postdoctoral fellows and ECRs in industry. These programmes will be co-designed and implemented by academia, the NRF and Industry partners, it should be aligned to large collaborative projects.
- Partial repurposing of NRF funding programmes to include placement of candidates in local industries.

- Developing internship programmes that foster placement of candidates in specific industry (labs and research work environments). The candidate's research focus will be aligned with those of the industry partners.

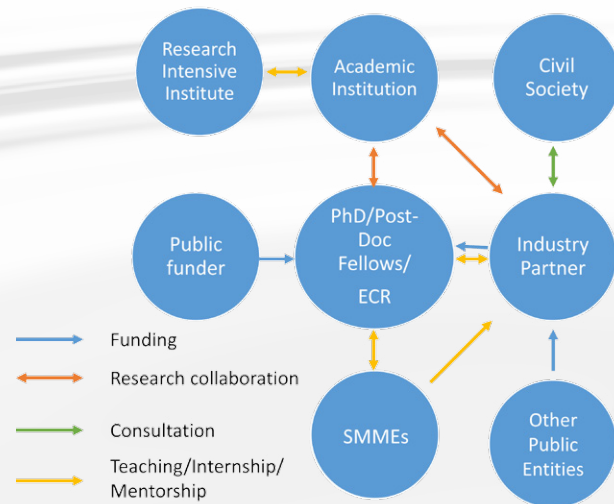


Figure 3: Illustration of the HCD approach

International placements: Placement of candidates in universities (aligned with industry programmes) or at industry partners based outside the borders of South Africa. This programme will be achieved by:

- Leveraging international partnerships for placements outside South Africa, aligned with the GKP Strategy.
- Partial repurposing of NRF programmes to include placement of candidates at internationally-based industries.
- Leveraging international partnerships for funding and placements.
- Provide a platform to increase networks for candidates working in partnership with international funding partners, universities and industry.

Funding model

- The NRF is purposeful in directing funding guidelines for a combination of mobility, research and human capital development, incorporated into its current suite of research support.
- The industry partner provide funding and/ or expenses aligned to the candidate's residency at the firm, combined with negotiated support mechanisms from a research organisation (i.e. the National Facilities) and universities. As an example, the NRF and the Canadian Mitcs are finalising an agreement for broad-based, tailored placement and exposure opportunities between South Africa and a large number of Canadian firms.

4.2 INTER-SECTORAL RESEARCH COLLABORATION

Collaborative research programmes will seek to provide a platform for continuous interaction of academic researchers, students and staff with industry; ensure that the research outcomes remain relevant to the needs of industry; and promote the flow of knowledge between the academic and industrial sectors. This programme will focus on selected fields proposed by the NRF Research Agenda (i.e. Health, Smart Economy, Environment, Resource Security and Nation Building). Through this approach, industry will work with academia to develop solutions that have both socio-economic and commercial benefit. The proposed approach is outlined below and illustrated in Figure 4.

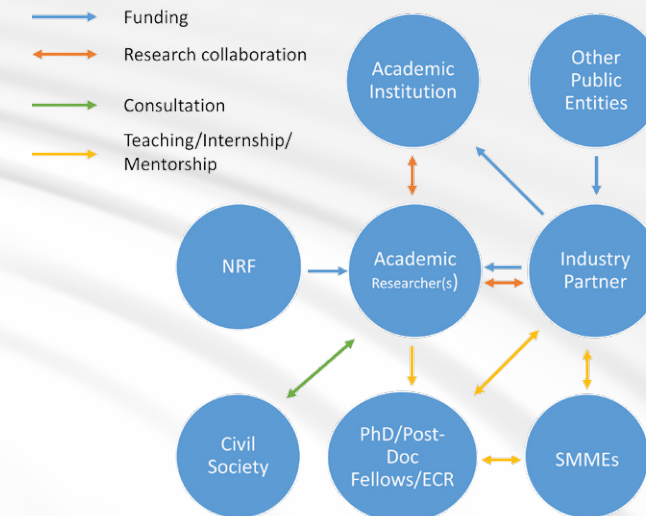


Figure 4: Illustration of proposed joint research approaches

Modality

- The NRF identifies and engages industry partners (private and SOEs) for potential joint research programmes. This could be through the Research Chairs or Community of Practice programmes that bring together experts from industry and academia.
- Programmes will be co-designed and managed by both academia and industry. The industry partner will work with the successful university or facility to develop detailed proposals and to ensure collective approaches.
- The NRF will provide guidance with regards to research priorities, facilitation of industry relationships, and managing research design and the application processes.
- ECRs funded will spend a percentage of their time working at the industry partner in order to build the skills necessary for innovation.

Funding model

The programmes will be funded for a minimum of a 5-year cycle, with funding ratios dependent on partnership agreements.

The industry partner will provide funding and/ or infrastructure to the institution.

The sustainability of funded projects are ensured by the early involvement of other public funding agencies, and funding for the continuation of the research will revert to TIA once it has moved to the commercial development stage. As an example, the NRF and the Water Research Commission (WRC) are jointly developing a partnership framework aligned with the core mandate of the two organisations, with the intent to increase uptake of research in the innovation value chain. This includes collaboration in design, implementation and funding of national, regional and international programmes. Similar approaches will be used with other organisations in South Africa.

4.3 NETWORKS

Underpinning the Strategy is a strong networking platform aimed at stimulating partnerships, growing the level of trust and increasing the flow of knowledge among academia, industry and other partners in South Africa and globally. This will be achieved through various platforms including a comprehensive database of industry and academia partnerships in South Africa and beyond. The broad range of investment of foreign countries' business chambers in South Africa, and its stated intent and interest in expanding on the potential of enhanced engagement with academia, will be an important avenue to pursue and develop.

This pillar of the Strategy is aligned with the NRF GKP Programme, which in addition to its stated intent, will utilise and focus the network of engagements through existing and new partnerships at national and global level. This will include:

- Development of agreements with a pool of likeminded R&D performing institutions with a goal of increasing interaction and joint research between these entities and academia at national level.
- Development of strategic partnerships with international partners.

- Coordination and alignment of NRF programmes with industry partnerships.
- Development and management of virtual platforms to encourage networking and documentation of research collaboration. As new industry partners are identified, their priority areas will be matched with the appropriate research partners based on information captured in the virtual platform.
- The creation of physical platforms/ workshops that bring together academia, industry researchers, and other actors to dialogue on research and human capacity development needs and agendas.

VALUE PROPOSITION

In order to increase industry collaboration, public policy may influence the propensity of firms to collaborate with academia. The scope of such collaboration may differ in some ways: through a direct role in providing funds to universities, Science Councils and National Facilities; as well as through a regulatory role, which influences the rule-sets of public research and shaping the intellectual property rights regime.

An example of a facilitative mechanism from a public sector perspective, is the Research and Development Incentive offered by the South African Government. This scheme, introduced into the Income Tax Act in 2006 (Section 11D) allows a deduction equal to 150% of expenditure incurred directly for R&D. This incentive is designed to further encourage industry to undertake R&D. The 2016/17 annual report of the scheme indicates that participation is improving (albeit still relatively small), but importantly that the incentive scheme strengthens local companies' ability to develop new value-added products, processes, technologies and services, with the additional benefit of supporting knowledge transfer and skills development.

PROPOSED IMPLEMENTATION PLAN

Implementation will require a realigned financial and risk framework that strengthens the Strategy's sustainability and expands its capacity. The Strategy takes into account a coordinated approach for leveraging additional resources to support the broader NSI:

- A comprehensive review of current research centres, research chairs, scholarships and research awards will be undertaken to identify current (and future) research that might be eligible to be linked to an industry partner, thereby increasing the value of that instrument without creating additional instruments.
- Identification of industry players who currently undertake R&D within their business (possibly via the Tax Incentives Rebate, if privacy laws allow) to determine who might be open to partnership.
- Strategically communicate the NRF Industry Partnership Strategy to the appropriate stakeholder groups.
- Initiate direct engagement with stakeholders on potential collaboration opportunities – building on existing partnerships in this sphere, and leveraging this potential.
- Create an advisory board/ steering group of executives from selected industry sectors and appropriate representation from academia who will develop an understanding of the key scientific and technological priority needs.
- Develop a standard proposal (adaptable for specific engagements) that clearly stipulates the NRF's intent and goals for the Strategy, and that is clear in its value proposition.
- Clarify and manage stakeholder expectations.

INDICATORS OF SUCCESS

Outcomes	Indicator (over a five-year period)	Risk
Increased funding and exposure opportunities for ECRs: Increasing postgraduate funding opportunities through industry and academia partnerships Provide a platform for enhancing practical experience and career opportunities for NRF-funded ECRs. For example: internship programmes, and joint research that directly links to industry and societal need and job opportunities	<ul style="list-style-type: none"> • The total amount of funding available for ECRs, excluding core NRF funding, increases over five years • A significant percentage of NRF-funded ECRs provided with practical opportunities at industry partner organisations • Increased number of research projects undertaking collaborative research between academia and industry 	<ul style="list-style-type: none"> • Unable to develop mutual partners willing to jointly fund ECRs • Supervisors reluctant to release their students to undertake placements
Innovative collaborative research: Stimulating innovative research that directly responds to socio-economic and environmental issues through joint programme design and collaborative research between academia and industry	<ul style="list-style-type: none"> • An increased percentage of projects funded by the NRF are aligned to other key stakeholders in the NSI (e.g. uptake by TIA for potential patents / commercialisation outcomes) • Increase flow of staff transfer between academia and industry 	<ul style="list-style-type: none"> • Gaining buy-in and commitment from key stakeholder in order to review projects • Creating a sustainable pipeline of funding to ensure development of prototypes beyond the research funding from the NRF
Knowledge and technology transfer: Foster reciprocal knowledge and technology transfer between academia and industry	<ul style="list-style-type: none"> • Increased number of co-authored papers by academia and industry researchers 	Intellectual property restrictions from the industry partner conflicting with open data policies from universities/ academia

CONCLUSION

Strategic partnerships with industry will play a critical role in identifying and facilitating opportunities for joint collaborative research to address national, regional and global challenges. These collaborative partnerships provide an opportunity to focus on impact-oriented research with a diverse scope and scale that role players within the NSI would not be able to undertake on their own. The NRF will focus on building high-impact, large-scale research collaboration partnerships of significant scope with clear alignment to the Research Agenda themes, while building opportunities for innovative skills development through industry placement and networks.

ANNEXURE 1: SELECTED PUBLIC STI FUNDING ACTORS

Actors	Institutional mandate	Industry partnership approach	Focus domains
Department of Trade and Industry	<ul style="list-style-type: none"> Promoting structural transformation towards a dynamic industrial and globally competitive economy; Funding support for industry linkages through THRIP Exclusive to applied research South African scope 	<ul style="list-style-type: none"> Calls launched inviting industry to apply for THRIP partnerships and incentives Three-year funding range in partnership with industry, SMMEs and university Students not directly funded 	<ul style="list-style-type: none"> Funded programmes have high potential to be commercialised
National Research Foundation	<ul style="list-style-type: none"> Research, knowledge funding, and innovation promotion Research, knowledge and innovation performance Human capacity development support Science engagement Global and continental scope through SGCs outside the country 	<ul style="list-style-type: none"> Direct engagement approach with industry to build partnership trust Research and innovation funding support to universities and other research performing entities Funding of human capacity development Research through national infrastructure facilities Provision of research and innovation platforms Science outreach, namely participation by the public in programmes aimed at generating public response to science 	<ul style="list-style-type: none"> Supports all forms of science (physical and social) with the exception of technology development Direct engagement approach with industry Strong regional and global presence
Water Research Commission	<ul style="list-style-type: none"> Promoting coordination, cooperation and communication in the area of water research and development 	<ul style="list-style-type: none"> Establishing water research needs and priorities Stimulating and funding water research according to priority Promoting effective transfer of information and technology Enhancing knowledge and capacity-building within the water sector 	<ul style="list-style-type: none"> Focusses exclusively on water and environmental-related research
Technology Innovation Agency	<ul style="list-style-type: none"> Technology innovation at the proof of concept stage Funding and nurturing of technology development 	<ul style="list-style-type: none"> Seed funding to higher education institutions and SMMEs to advance research outputs and ideas to develop prototypes Bridges the innovation chasm between research and development from universities, science councils, public entities and private sector, and commercialisation 	<ul style="list-style-type: none"> Funds projects that have already shown commercial viability Facilitates the translation of South Africa's knowledge resources into sustainable socio-economic opportunities
Industrial Development Corporation	<ul style="list-style-type: none"> Commercially sustainable industrial development and innovation 	<ul style="list-style-type: none"> Identify and fund high-impact projects Lead the creation of viable new industries Use diverse industry expertise to drive growth in priority sectors Take up higher-risk funding in early-stage and high-impact projects 	<ul style="list-style-type: none"> Provides funding in support of industrial capacity development
State Owned Entities (Telkom, Transnet, Denel, Eskom, etc.)	<ul style="list-style-type: none"> Research generally dedicated to technical performance optimisation and testing 	<ul style="list-style-type: none"> Partner with both science councils (e.g. CSIR) and universities to conduct research 	<ul style="list-style-type: none"> Each SOE has a specific field of interest which they can focus all of their R&D funding on



**National
Research
Foundation**

www.nrf.ac.za