edtea

Department :
Economic Development, Tourism and Environmental Affairs

PROVINCE OF KWAZULU-NATAL

Final Draft Kwazulu-Natal Innovation Strategy (2017 – 2027)

Prepared:

January 2017

Table of Contents

List of Figures

List of Tables

Abbreviations and Acronyms

S-Squared Consortium	Referring to a consortium comprising Sigma International and Sifco Trading
ARC	Agricultural Research Council
ASGISA	Accelerated and Shared Growth Initiative for South Africa
BRICS	Brazil, Russia, India, China, South Africa
CIPC	Companies and Intellectual Property Commission
CSIR TLIU	Council for Scientific and Industrial Research Technology Localisation Implementation Unit
DUT	Durban University of Technology
DST	Department Of Science And Technology
DTI	Department of Trade and Industry
DTI SPII	Department of Trade and Industry Support Programme for Industrial Innovation
DTP	Dube Trade Port
FETs	Further Education and Training
FGDs	Focus Group Discussions
GCI	Global Competitiveness Index
GDP	Gross domestic product
GII	Global Innovation Index
GVA	Gross value added
GWI	Graduate Women International
HEIs	Higher Education Institutions
HSRC	Human Sciences Research Council
ICT	Information and Communications Technology
ICTE	Informational, Communication, Technology and Electronics
IDC	Industrial Development Corporation
IDP	Integrated Development Planning
IDZ	Industrial Development Zone
IP	Intellectual Property
IPR	Intellectual Property Rights
IPAP	Industrial Policy Action Plan
LED	Local economic development
KZN	Kwazulu-Natal
KZN EDTEA	Kwazulu-Natal Economic Development, Tourism and Environmental Affairs
MUT	Mangosuthu University of Technology
NACI	National Advisory Council on Innovation
NDP	National Development Plan
NEF	National Empowerment Fund
NIPF	National Industrial Policy Framework
NIPMO	National Intellectual Property Management Office
NGOs	Non-Governmental Organization
NRF	National Research Fund
NSDP	National Spatial Development Perspective
OECD	Organization for Economic Cooperation and Development
PGDP	Provincial Growth and Development Plan
PGDS	Provincial Growth and Development Strategy
PIDS	Kwazulu-Natal Provincial Industrial Development Strategy
PSEDS	Provincial Spatial Economic Development Strategy
PWD	Public Works Department
R&D	Research & Development
RIS	Regional Innovation System
R&ED	Research & Experimental Development
SA	South Africa
SALGA	South African Local Government Association
SASSDA	Southern Africa Stainless Steel Development Association
SANRD	South African National Research and Development
SEDA	State Enterprise Development Agency
SEZ	Special Economic Zone
SMME	Small, Medium and Micro Enterprises
SOPA	State of the Province Address
SONA	State of the Nation Address
STIP	Science, Technology and Innovation Park
SWOT	Strengths, Weaknesses, Opportunities, and Threats
THRIP	Technology and Human Resources for Industry Programme
TIA	Technology Innovation Agency
TVET	Technical Vocational Education and Training
UKZN	University of KwaZulu-Natal
UNISA	University of South Africa
WEF	World Economic Forum

Executive Summary

Kwazulu-Natal Department of Economic Development, Tourism and Environmental Affairs (KZN EDTEA) realises the significant contribution of having a provincial innovation strategy for both advancing industrialisation, as well as ensuring an inclusive economic development agenda. Subsequently, the Department sought service providers to assist in the development of an innovation strategy for KZN. *S-Squared Consortium* (comprising Sigma International and Sifco), were appointed in May 2016, to develop the innovation strategy for the province. It must be noted that this is the first innovation strategy developed for the province.

Key project objectives were as follows:

- To conduct a Provincial Innovation Audit for KZN
- To develop a KZN Provincial Innovation Strategy (with a 10-year horizon)
- To develop an Implementation Plan with specific initiatives/ projects for the short, medium and long-term
- To develop a Monitoring and Evaluation Framework to monitor and evaluate implementation of the Innovation strategy for its duration

S-Squared Consortium have adopted a highly-intensive stakeholder engagement approach, to ensure the development of a robust and effective innovation strategy.

This Innovation Strategy has been developed based on findings emanating from the Provincial Innovation Audit. The key themes emerging from the audit, on which the strategy is based are:

- The need for extensive **awareness and understanding** of the importance of innovation
- The need for effective **stakeholder collaboration that is inclusive** (i.e**. quadruple-helix innovation** approach **and knowledge-sharing** by nature) is of paramount importance to the success of innovation development, hence the theme of the strategy being "*Innovation by Collaboration"*
- A **needs-based approach** to innovation development that encourages all citizens of the province to be proactive and identify creative and/ or innovative ways to solve problems that will improve quality of life (social innovation imperative)
- Innovation development efforts should be focused in its approach and **prioritized by key sectors and/ or KZN catalytic projects, per district**.

- **Relevant skills and human capital development needs to be prioritised**, a key ingredient for the development of KZN's knowledge economy and economic growth.
- Support for entrepreneurs/ enterprises, the key drivers of KZN's economy, such that they are able to enhance their competitiveness and sustainability, by being more innovative
- The need for an **enabling environment to support innovation development** in the province that includes the enabling institutional arrangements, infrastructure (and ICT) and funding support.

As such, the proposed model for the innovation strategy encompassing four key focused strategic pillars is illustrated in Figure 1 below.

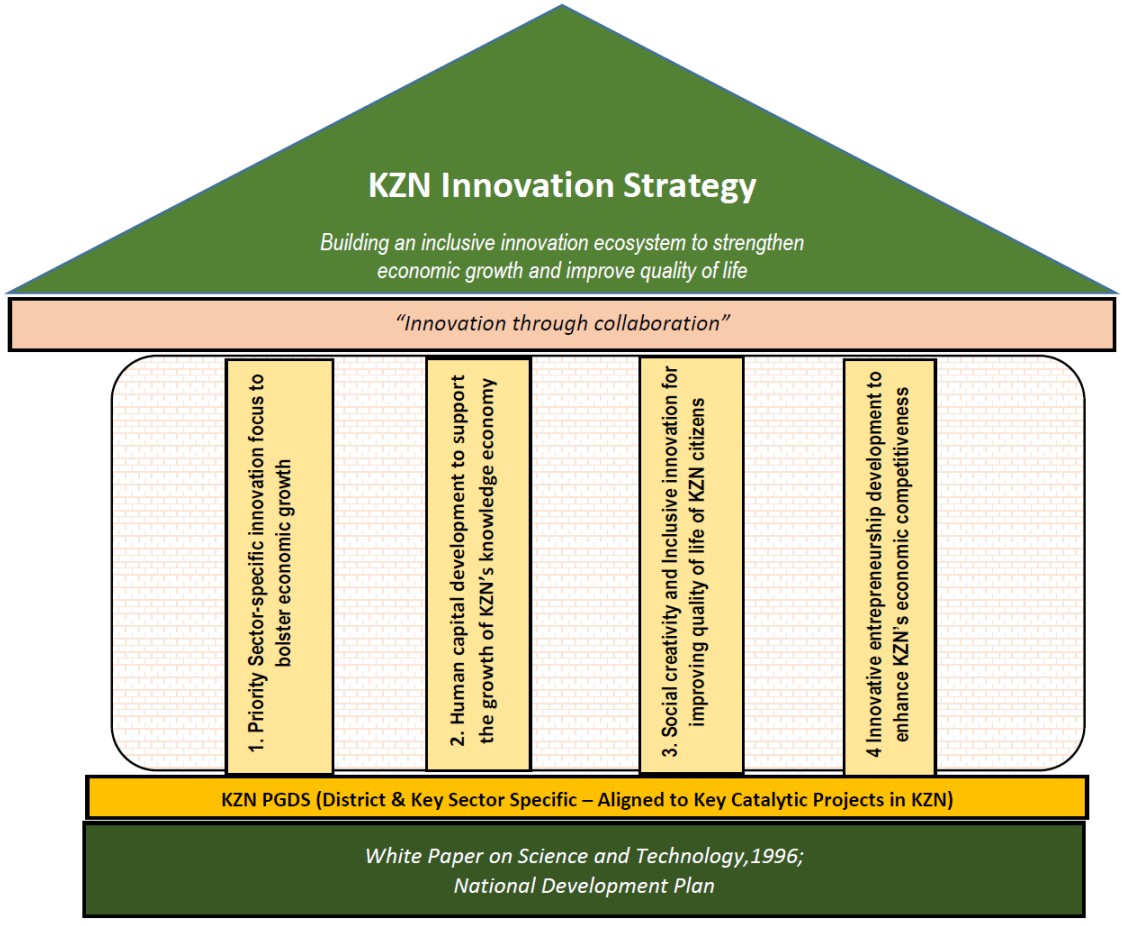


FIGURE 1: STRATEGIC MODEL OF THE KZN INNOVATION STRATEGY (2017 - 2027)

This KZN Innovation Strategy is intended to prioritise sector and economic growth of the province, and is therefore aligned to the *KZN PGDS* (and key catalytic projects of the province). In addition, the strategy is governed by the key national (and innovation/ ICT) regulatory frameworks, that being the *White Paper on Science and Technology (1996)* and the, and the *NDP*.

The proposed mechanism of delivery is built around the following key elements:

- Encouraging a needs-based approach to innovation development in the province
- Inclusivity (creation of an inclusive innovation stakeholder platform (quadruple-helix innovation approach) comprising government, business, academia and civil society.
- Coordinated approach to innovation development
- Reducing red tape and bureaucracy by creating an agile model
- Encompass a model that is **hybrid in nature** i.e. that considers both the **geographic/ regional** as well as the **sectoral profiles** per district.

The delivery mechanism proposes a central innovation coordinating body (the KZN Innovation Council) (recommends to be co-chaired by EDTEA (Policy and Planning Unit) and TIA), that is mandated by a KZN Innovation Charter. The KZN Innovation Council will oversee innovation development across the province, via the proposed Regional Innovation Forums (RIFs) for five regions in KZN.

This strategy comprises three parts namely:

i. Part A – Innovation Landscape
ii. Part B – Baseline Innovation Audit Findings
iii. Part C – KZN Innovation Strategy

The success of this ten year strategy is largely dependent on the following key factors:

- Buy-in and acceptance of the KZN Strategy from key decision-makers is critical
- Stakeholder collaboration to implement the KZN Innovation Strategy in a cohesive manner (across the innovation value chain)
- Custodian of the KZN Innovation Strategy (EDTEA) to adopt the proposed delivery mechanism

Methodology

The following methodology (illustrated in Figure 2 below) was employed in the development of the Innovation Strategy for KZN Province. The process was largely driven by key stakeholder engagements.

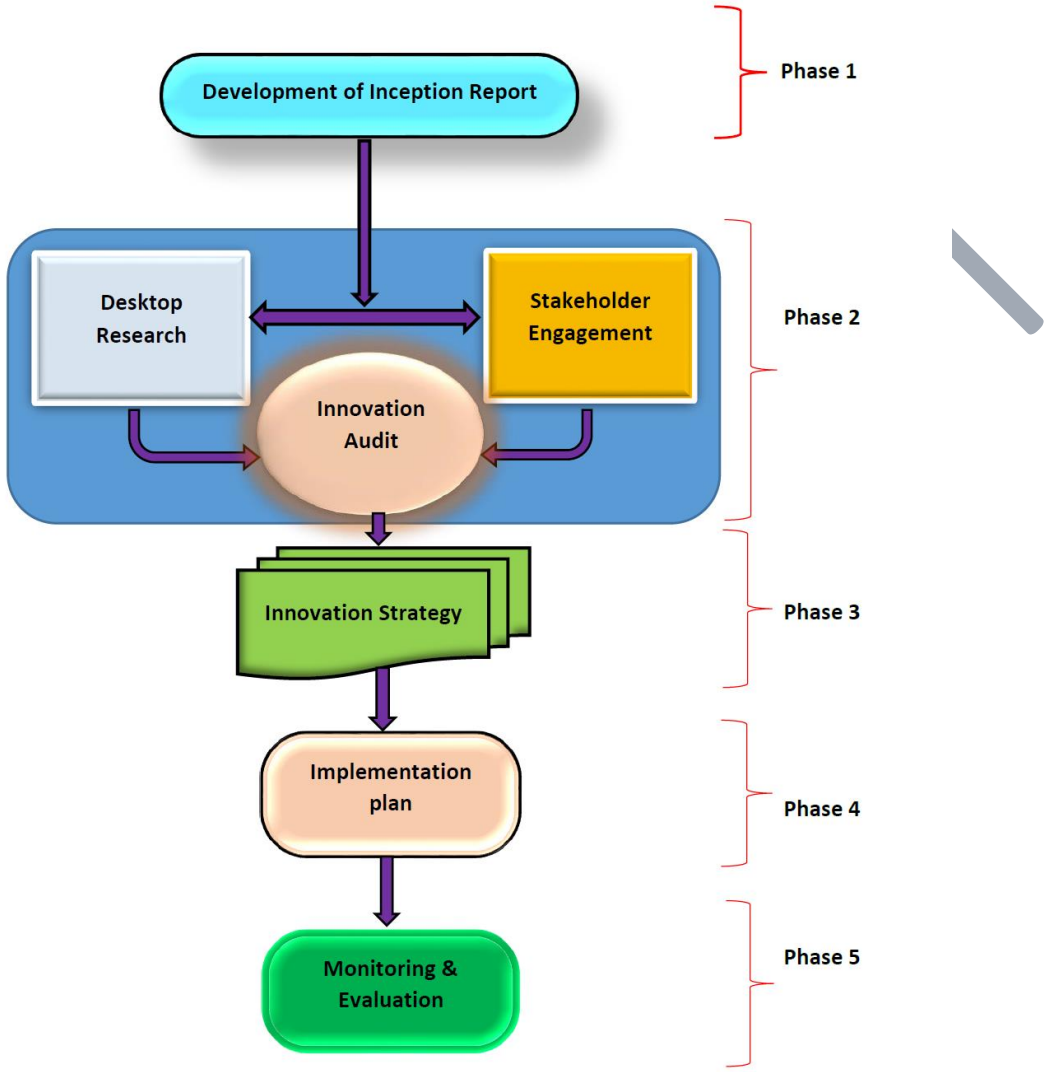


FIGURE 2: METHODOLOGY USED IN THE DEVELOPMENT OF THE KZN INNOVATION STRATEGY

Phases 1 and 2 have been completed and reported on separately. This document is a draft innovation strategy (Phase 3 of the assignment).

Introduction

Definition of Innovation

The Innovation Baseline Audit revealed stakeholder understanding, perception and definition of innovation is quite varied.

The South African Research and Development Strategy (2002) states that "*Innovation is the key process by which products, processes and services are created, and by which* ***businesses*** *generate jobs and wealth"*.

The *Oslo Manual* (OECD/Eurostat, 2005) highlights four main types of innovation (refer Figure 3 below) and define it as"***the implementation of a new or significantly improved product (good or service) or process, a new marketing method, or a new organisational method in business practices, workplace organisation or external relations***":

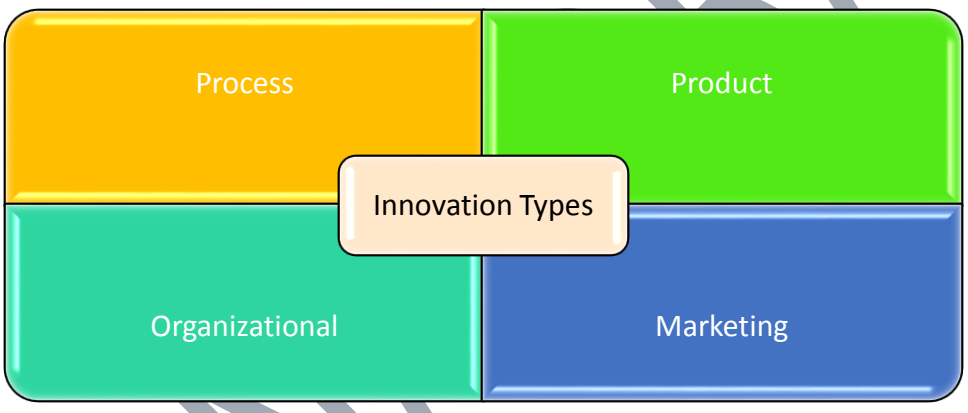


FIGURE 3: FOUR TYPES OF INNOVATION (PRODUCT, PROCESS, ORGANIZATIONAL AND MARKETING)

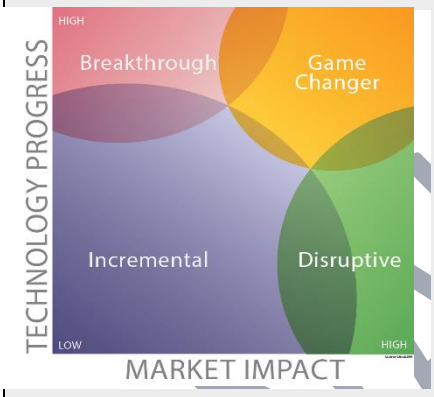
Kalbach, 2012 goes on further to describe four distinct zones of innovation (Figure 4 below), based on technology progress and market impact:

Incremental innovations involve modest changes to existing products and services. These are enhancements that keep a business competitive, such as new product features and service improvements.

Breakthrough innovation refers to large technological advances that propel an existing product or service ahead of competitors. This is often the result of research and development labs (R&D), who are striving for the next patentable formula, device and technology. Breakthrough innovations promise significant improvements in performance compared with existing products.

Disruptive innovation, is a term coined by Clayton Christensen. In his best-selling book The Innovator's Dilemma, Christensen shows that disruptive innovations *bring to a market a very different value proposition than had been available previously*". Disruptive innovations address underserved market needs with products that are more convenient to access, easier to use, and cheaper to buy.

Game-changing innovation transform markets and even society. These innovations have a radical impact on how humans act, think and feel in some way.



Y-AXIS INDICATES DEGREE OF TECHNOLOGICAL PROGRESS (MOVING FROM LOW TO HIGH INDICATES IMPROVING EXISTING CAPABILITIES, SERVICES AND PRODUCTS

X-AXIS SHOWS IMPACT INNOVATION HAS ON THE MARKET AND USUALLY ENTAILS NEW BUSINESS MODELS OR REACHING UNDERSERVED GROUPS

FIGURE 4: TYPES OF INNOVATION BASED ON TECHNOLOGY PROGRESS AND MARKET IMPACT (INCREMENTAL, BREAKTHROUGH, DISRUPTIVE AND GAME-CHANGING)

Today, many governments are putting innovation at the centre of their growth strategies. There is awareness that the definition of innovation has broadened— it is no longer restricted to R&D laboratories and to published scientific papers. Innovation is more general and horizontal in nature, and includes social innovations, business model innovations and innovation in the creative sectors. Thus recognizing and celebrating innovation is seen as critical to inspire people—especially the next generation of entrepreneurs and innovators (GII, 2016).

According to Baregheh, *et al* (2009), definitions of innovation today contains elements that overlap and often seem contradictory. This leads to "a situation in which **there is no clear and authoritative**

definition of innovation" (Baregheh, *et al*., 2009, p. 1324). Yet, **innovation occurs when humans employ a creative process to meet a particular need: innovation begins at a very human level**.

The Vienna Declaration (*2011 Challenge Social Innovation Conference*) promotes social innovation as an urgent alterative to technology-oriented innovations that fail to solve the problems that arose moving from an industrial to a knowledge and service-based society. According to the declaration, "*such fundamental societal changes require the inclusion of social innovations in a paradigm shift of the innovation system*" (Vienna Declaration, 2011). It addresses the major societal challenges identified by the Europe 2020 strategy, which requires *social* innovation in the fields of unemployment, climate change, education, poverty and social exclusion.

Martinelli (2012) characterizes *'social innovation'* (as opposed to other narrower notions of innovation) to have the following features:

- It contributes to *satisfy human needs* that would otherwise be ignored;
- It contributes to *empower individuals and groups*;
- It contributes to *change social relations*

Wittig (2014) recently defined **social innovations** as "***new solutions to social challenges that have the intent and effect of equality, justice and empowerment".***

Creativity, often synonymous with innovation, is defined as the ***"tendency to generate or recognize ideas, alternatives, or possibilities that may be useful in solving problems, communicating with others, and entertaining ourselves and others***" (Franken, 1982). Three reasons why people are motivated to be creative:

1. need for novel, varied, and complex stimulation
2. need to communicate ideas and values
3. need to solve problems

Inclusive innovation addresses the ***needs of persons with low incomes. It can be high technology or low technology; based on the efforts of firms, governments, non-government organizations, or individuals, or even grassroots innovators with little formal education. A key characteristic of inclusive innovation is its applicability and/ or accessibility to low income populations*** (Dahlman, 2014)

Key Findings
It has been found during the extensive stakeholder engagement and desk-top research that the definition of innovation and types of innovation is varied and broad. There is no one clear and holistic definition of innovation that speaks to all stakeholder types.

Considerations for KZN Innovation Strategy
Definitions for innovation that are inclusive of all stakeholder types (organizational and social), to be considered in the strategy.

Why Innovate?

The capability to innovate and to bring innovation successfully to market has been noted to be a crucial determinant of the global competitiveness of nations. There is growing awareness among policymakers that innovative activity is the main driver of economic progress and well-being as well as a potential factor in meeting global challenges in domains such as the environment and health (OECD, 2007).

The world economy has encountered a number of challenges that have led to further downgrades of global economic growth projections. In the context of such uncertainty, countries will seek ways to move the global economy out of its current holding pattern, thus avoiding a prolonged low-growth scenario. Innovation will be a critical ingredient to achieving this objective (GII, 2016). Innovation has been identified as being important to help **address global challenges**, such as climate change and sustainable development. Due to the growth in technologies such as the internet, increased global access to knowledge pools, and "deepening global supply chains", the **cost of innovation has been greatly reduced**.

The GII 2016 highlighted the following prominent findings with respect to innovation:

- Leveraging global innovation can help avoid a continued low-growth scenario
- There is a need for a global innovation mindset and discussions on fresh governance frameworks
- Innovation is becoming more global but divides remain
- There is no mechanical recipe to create sound innovation systems; entrepreneurial incentives and "*space for innovation*" matter
- Sub-Saharan Africa needs to preserve the innovation momentum in one of the most promising regions

At the *World Economic Forum* on Africa held recently in Kigali, Rwanda (11-13 May 2016), the overarching theme was ''*Connecting Africa's Resources through Digital Transformation*'', with the spotlight being on the need using innovation and technology to improve Africa's competitiveness and productivity and specifically to increase opportunities for youth.

South Africa continues to face extremely difficult operating and trading conditions. The fall in commodity prices has seriously weakened commodity-dependent economies, including South Africa (GII, 2016). South Africa's economy expanded by a mere 0.6% on a quarterly basis in the final quarter of 2015, taking real GDP growth to 1.3% for the year as whole.

The *South African National Research and Development Strategy* (2002) noted that "*Innovation is the engine of economic growth and wealth creation*" (SANRD Strategy, 2002: 37). In the social sphere, effective innovation has a direct impact on the **reduction of poverty** and the **improvement of the quality of life of our people**. **(SANRD Strategy, 2002: 5).**

The importance of innovation has been highlighted in both the NDP and the KZN PGDP, respectively, for creating a conducive investment climate for business, as well as enhancing our knowledge economy.

The province of KZN, via the development and implementation of this provincial innovation strategy, is aiming to provide a cohesive approach to innovation efforts in the province. In addition, it is intended to provide a reference for using innovation to drive current and planned key catalytic and strategic projects (such as *Aerotropoli*s, Dube Trade Port, and several others), that will help boost our province's economic growth.

Key Finding

- Innovation plays a significant role in enhancing economic growth and wealth creation.
- Innovation has been identified as important to resolving social challenges

Considerations for KZN Innovation Strategy

Innovation initiatives in the province should be aligned to the strategic initiatives and economic plans of the province (KZN Provincial Growth and Development Strategy) to enhance KZN's competitiveness and growth of its knowledge

Part A – Innovation Landscape

National Innovation Policies

A review of the key influencing national innovation policies, legislation and regulatory frameworks that govern the innovation landscape was conducted. A summary of the key findings is tabulated below (Table 1), reveal that South Africa does have an enabling environment to support innovation development and is governed by a strong institutional framework for innovation development (this is supported by review of South Africa on the GII 2016 Institutions pillar of the Innovation input index).

TABLE 1: SUMMARY OF KEY FINDINGS OF NATIONAL POLICIES AND REGULATORY ENVIRONMENT REVIEW

National Policies/ Acts/Regulatory Framework	Context/ Influencing factors for Innovation
National Development Plan (NDP) 2030	• There is a need to **enhance the national research and innovation system** • "South Africa's global competitiveness needs to be improved" and that the "system of innovation has a key role to play" • I**CT is a critical enabler of economic activity** in an increasingly networked world", and as such can contribute to economic development by **improving productivity and efficiency through enhanced communication and information flows** (NDP, p189).
White Paper on Science and Technology 1996	• The White Paper on Science and Technology (1996) is the most pivotal policy document in South African in relation to innovation. • It states that many countries view **technological change as the primary source of economic growth** • Aim of the White Paper was to create a national system of innovation through ensuring that **institutions, organisations and policy interact towards reaching a common goal**
National Advisory Council on Innovation Act 1997	• The Act makes provision for the establishment of a council called the **National Advisory Council on Innovation.** • NACI shall **advise the Minister**, and through the Minister, the Ministers Committee and the Cabinet, on the **role and contribution of science, mathematics, innovation and technology, including indigenous technologies, in promoting and achieving national objectives**, namely to improve and sustain the quality of life of all South Africans, develop human resources for science and technology, build the economy, and strengthen the country's competitiveness in the international sphere.
National Integrated ICT Policy White Paper 2016	• Information and Communication Technologies (ICTs) can play a key role in facilitating all the objectives of the NDP. The White Paper sets out how Government will realise this potential. • It is premised on furthering the Constitutional objective of improving "*the quality of life of all citizens"* and freeing *"the potential of each person*" • The White Paper outlines the overarching policy framework for the transformation of South Africa into an **inclusive and innovative digital and knowledge society**. It reinforces and extends existing strategies such as **South Africa Connect**, the **National Broadband Policy**, the **National Cybersecurity Policy Framework**, **2012 and the National Information Society and Development Plan.**
South African National Research and Development Strategy 2002	• The strategy is underpinned by three key pillars being: - Innovation (the establishment and funding of a range of technology missions that are critical to promote economic and social development) - Science, engineering and technology (SET) human resources and transformation - Creating an effective government S&T system
Ten Year Innovation Plan 2008 – 2018	• The Plan aims to build a **knowledge-based economy** driven by the **enablers of human capital development, research & development, knowledge infrastructure and closing the gap between research and socio-economic impact.**

	• Plan identifies 'grand challenges' in place of goals that include strengthening the bio-economy, space science and technology, energy security, climate change science and the role of science in stimulating socio-economic growth and development • Plan is criticised by Hart, Jacobs and Mhula (2013) for being too focussed on global challenges and appearing to pander to a global audience. They question whether these challenges are truly the grand innovation challenges of South Africa and state that these goals are exclusive of marginalised segments of society.
National Industrial Policy Framework (NIPF) 2007:	• Provides 13 Strategic Programmes, which includes development of Innovation and Technology. • Innovation and Technology falls within the 'industrial upgrading interventions', and highlights two key focus areas, namely, "further development of pockets of technologies in which South Africa has a potential advantage" and "stronger support for product development and commercialisation of intellectual property (IP), particularly IP developed through public funding"
Industrial Policy Action Plan (IPAP) 2016/17-2018-19:	• Science, Innovation and Technology' focus areas for 2016/2017 identified in IPAP 2016/17 • specifically relates to "leveraging science, technology, and innovation for industrial growth and development"
Review of South African Innovation Policy and Strategy 1994-2012: Innovation for Rural Development	• The Human Science Research Council (HSRC) together with the Department of Science and Technology conducted a review of innovation policy and strategy documents from 1994 until 2012 and concluded that rural innovation is "largely overlooked" (Hart, Jacobs & Mhula, 2013:5). • Marginalised population groups are not included in policy development or programmes. The review points out that there is a natural tendency for innovation programmes to flourish within developed sectors of the economy such as transport, engineering and medical sciences while the pathway between innovation and less defined sectors such as arts and tourism is unclear. • "Of extreme importance is the lack of indication of how the core problems of South Africa – unemployment, poverty and inequality – are to be addressed by way of a restructured NSI"
2012 Ministerial Review on the Science, Technology and Innovation Landscape in South Africa	• The final report of the Ministerial Review Committee on the Science, Technology and Innovation Landscape (2012) sought to review the National System of Innovation (NSI). The purpose was to identify the important actions that are required to enhance innovation within the system and "deliver a sustained and durable knowledge-based economy". A review paper of this report highlighted published in 2012 by Welwyk and Hagendijk,, provided an assessment of some of the reports' recommendations (that primarily focused on institutional arrangements, social innovation funding, M&E, human capital and "other": **Category** / **Recommendation** / **Comments** New structures or revision of existing structures / 9 / Structures themselves do not solve problems or improve existing situations; the document places too much emphasis on structures rather than programmes of action and targets that can be assessed. Social innovation / 1 / The interpretation of social innovation is limited, underdeveloped and coupled almost exclusively to poverty alleviation. New funding or budget processes / 11 / Funding is still the most influential way of developing and endorsing new behaviour. The document has a number of clear and important funding recommendations, but some require further development to be adequately appreciated. Monitoring and evaluation / 3 / Monitoring and evaluation is essential to good decision-making; good data drives good decisions, but only when the data and the background analysis are open to participants and decision-makers. Human capital / 6 / Human capital remains one of the most important and permanent constraints within the National System of Innovation. The problem affects both the present operations of the system as well as its long-term viability, yet it is not clear whether there is any new thinking in this area. Other / 11 / This group contains a spectrum of other recommendations which are vague in content and/or platitudes, which will be impossible to implement. The authors went on to provide additional recommendations to the report, that included: ○ The need to reinvigorate existing governance structures that would "enhance the visibility of innovation in all spheres of society and make innovation policy more prominent on the political agenda ○ The need to create an enabling environment for innovation that includes increasing incentives for business innovation (or uptake thereof), increasing government R&D spend, particularly on health, manufacturing, telecommunications, energy ○ M&E to include reviews of industry R&D spends, labour market surveys and enterprises supported by government ○ Human capital development that includes the development of a human capital development strategy for the country to ensure growth of knowledge workers, in key sectors.
Planning for local economic development initiatives and	• In 2016, DST commissioned research on innovation within the most distressed areas of South Africa; 10 of the 27 distressed district municipalities were in KwaZulu-Natal. The study states, 'The most striking finding about this research is the almost complete **oversight of innovation in LED policy discussions across the municipalities** of the distressed areas' (Ndabeni & Rogerson, 2016:5).

the potential space for inclusive innovation in distressed areas	• This was recommended as an opportunity for DST to bring innovation into these areas and local plans. It recommended that **DST focus on SMME development, tourism and agriculture within these spaces and that all interventions be evidence-based** (Ndabeni & Rogerson, 2016).
DST Innovation Regulations	• The custodian of innovation regulation is the Department of Science and Technology. • Some of the major legislation impacting on innovation is as follows (DST, 2015:23): - **Science and Technology Laws Amendment Act**, 2014 (Act No. 7 of 2014): Amended the acts relevant to agencies of the DST in order to harmonize appointments to the boards of these national agencies reporting to the Minister of Science and Technology; - **Intellectual Property Rights from Publicly Financed Research and Development Act** (IPR Act), 2008 (Act No. 51 of 2008): Manages intellectual property through the National Intellectual Property management office and the IP Fund; - **Natural Scientific Professions Act**, 2003 (Act No. 27 of 2003): Regulates the registration of natural scientists. - **Section 11D of the Income Tax Act**, 1962 (Act No. 58 1962): Gives the Minister of Science and Technology the authority to approve any research and development undertaken or funded in the South Africa for a tax deduction in order to promote private sector research and development (R&D) activities in the country.

South Africa continues to make significant strides in providing an enabling environment for innovation development, that includes the recently introduced *National Integrated ICT Policy White Paper (2016)* and the announcement by the Minister of Science and Technology in October this year, that the process to develop a new *White Paper on Science and Technology* has been launched, together with a *Decadal Plan for Science, Technology and Innovation in South Africa*. However, it must be noted that, despite there being a significant 'platform' for innovation, the several reviews of the national system of innovation reveal that there is still an inadequate level of collaboration and fragmentation in the system.

The government implemented the *Intellectual Property Regulations from Publicly Funded Research and Development Act* in 2010 to promote a commercial outflow from research projects and to drive a better return on publically funded research investment. Although there has been criticism that the Act could negatively affect academia, intra-firm research alliances and international research collaboration, it is too early to determine whether this is the case (Jackson and Pepper, 2013).

The *2013 BioEconomy Strategy* highlighted that whilst regulation is a necessary instrument to protect the public, stimulate industry and innovation by setting standards, novel bioproducts that were locally developed or licensed continue to face regulatory hurdles that are unnecessary in some cases. In addition, bio-entrepreneurs who seek to transact intellectual property with international partners are often not given suitable guidance or support regarding exchange-control policies. These factors have, in the past, motivated local innovators to take their products to other countries, resulting in loss of intellectual property and job-creation opportunities for South Africa. Regulations regarding new bioproducts, and the mechanisms and bodies responsible for the enforcement of these regulations,

should be reviewed. The *BioEconomy Strategy* has made further recommendations for the regulations, related to the following Acts, to be reviewed for simplification/ ease of novel product development within the sector:

- *The Genetically Modified Organisms Act, 1997*
- *The Medicines and Related Substances Control Act,1965*
- *National Environmental Management: Biodiversity Act, 2004*
- *The National Health Act, 2003*
- *The Intellectual Property Rights from Publicly Financed*
- *Research and Development Act, 2008*
- *The Currency and Exchanges Act, 1933*
- *The Consumer Protection Act, 2008*

Key Findings

- There are several innovation key policies, strategies and Acts that set the tone for innovation development, nationally and provincially
- Social innovation is still largely under-developed
- Human capital development is a crippling constraint to the national innovation ecosystem
- Funding is a key influencer for developing creative mindsets
- ICT is a critical enabler of developing the knowledge base of the country
- Whilst there are a number of policies and Acts that support innovation development in the country, there is a need to ensure that these regulations are end-user friendly and do stifle innovation development

Considerations for KZN Innovation Strategy

- Alignment to key policies and strategies of the province
- High focus on human capital development,
- Catalyse social innovation
- Create a platform to advocate and lobby for more user-friendly regulations
- Create strong awareness of the regulatory environment (current and proposed)

South African Innovation in Context

The table below (Table 2) reflects key innovation benchmarking indicators for South Africa compared to its regional and global peers, by the various global innovation indexes and indicators

TABLE 2: SUMMARY OF KEY FINDINGS OF GLOBAL INNOVATION BENCHMARKING, SA STI INDICATORS REPORT AND SA R&D SURVEY

Innovation Benchmarking/ Index Tools	Key Finding
Global Competitiveness Index 2015/16	• **South Africa climbed seven places to 49th out of 140 countries on the Global Competitiveness Index (GCI) for 2015/16** (World Economic Forum, 2016). • Improvements owed to increased internet bandwidth and the knock-on ICT impacts. • Largest barriers to future competitiveness are health and the quality of education, specifically the rate of higher education enrolments. • South Africa is the 'region's most innovative' according to the index
Global Innovation Index 2016	• The top 5 nations in the **Global Innovation Index (GII) 2016** were, Switzerland, Sweden, United Kingdom, United States of America, and Finland. The Index notes that these leaders have created "well-linked innovation ecosystems" **as a result of their knowledge-based economies**, **through investment in human capital and innovation infrastructure.** • In the GII 2015, South Africa was **ranked 2nd within Sub-Saharan Africa** after Mauritius, while it **ranked 60th out of a total of 141 nations globally**. • In the GII 2016 (and similar to 2015), there were 9 Sub-Saharan countries that ranked in this year's top 100 economies in the GII: **Mauritius takes the top spot once again among all economies in the region, and ranked 53rd overall, followed by South Africa, 54th, improving significantly from 2015** • Led by economies such as Botswana, Mauritius, Rwanda, and South Africa, Sub- Saharan Africa countries in the GII 2016 show their highest scores in **Institutions and in Market sophistication** innovation index output pillars • South Africa, a large middle-income country, also moves upwards in the **overall quality of innovation** this year, and is mostly a consequence of a **better score in patent families. This advance places South Africa at 35th in that indicator and in 28th position overall in innovation quality.**
Bloomberg Innovation Index	• The Bloomberg Innovation Index ranks more than 200 countries on their overall ability to innovate (ranks countries according to research and development, manufacturing value-add within innovative industries, number of high-tech companies, post-secondary education, research personnel and patents). • Only the top 50 countries are reported on. The overall results place South Korea, Japan, Germany, Finland and Israel in the top 5. Three African countries made the top 50: Tunisia at 44, **South Africa at 49** and Morocco at 50.
The South African Science, Technology and Innovation Indicators for 2015 (NACI, 2015)	• Benchmarks South Africa against BRICS countries and other global leaders such as Japan, the USA and the UK • In comparison to these countries, **South Africa has relatively few science, engineering and technology enrolments and graduates from higher institutions**. • We also spend a **relatively lower proportion of GDP on research and development.**

	• As a result, South Africa produces **fewer research publications in the sciences**, is **responsible for fewer innovations and fewer manufactured exports than its counterparts**. • On average, 30% of enrolments in South African higher education institutions are in science, engineering and technology. This is lower than India and Brazil. • The **University of KwaZulu-Natal is placed fifth for research publications in South Africa**. The report also credits **KwaZulu-Natal for ranking second in South Africa for manufacturing contribution to GDP and employment.** • South Africa was awarded **152 international patents in 2014, which is 0.05% of the world total.** This indicator has been on a **declining trend since 2001**. • On the contrary, **revenue received for the use of intellectual property (technology receipts) has increased since 2005 to 1260 receipts in 2014 (0.033% of GDP)** (NACI: 2015).
South African National Survey of Research and Experimental Development:	• South Africa's gross expenditure on Research and Experimental Development (R&ED) increased by 1.4% between 2012/13 and 2013/14 and equated to R25.661 billion (0.73% of Gross Domestic Product). • The **business sector recorded the highest expenditure on R&D (46% of the total expenditure)**, followed by the higher education sector (28.4% of the total). • Higher education receives the largest portion of government funding (49%). • R&D personnel increased by 6% to 68 838 persons in 2013/14, mostly due to increased doctoral fellows in the higher education sector. The higher education sector employs the majority (66.7%) of the R&D personnel. • 46.7% of total R&D expenditure occurred within Gauteng Province, followed by Western Cape with 19.3% and **KwaZulu-Natal with 10.7% of total R&D spend.** • The bias of government spending on R&D towards Gauteng and the Western Cape is particularly pronounced as 61% of their expenditure is within these two provinces (**KZN receives only 9.5% of government expenditure**). • Not for profit R&D spending does not follow this same trend - Gauteng receives 30% of not for profit spending followed by **KZN which receives 29% of total not for profit spend** (DST, 2016).

- **South Africa has improved its innovation rankings (as per GII 2016), largely owing to its quality of innovation improving (particularly in patent families filed)**
- The largest barriers to SA's future competitiveness are health and the quality of education, specifically the rate of higher education enrolments
- **South Africa has relatively few science, engineering and technology enrolments and graduates from higher institutions. We also spend a relatively lower proportion of GDP on research and development. As a result, South Africa produces fewer research publications in the sciences, is responsible for fewer innovations and fewer manufactured exports than its counterparts.**
- 2015 SONA highlighted innovative sectors of the economy such as agro-processing, beneficiation in the mining sector, energy and the blue economy (via Operation Phakisa) (South African Government, 2016)
- There is a general oversight of innovation in LED policy discussions across the municipalities of distressed areas. DST, though, have identified the opportunity to bring innovation into these areas (example is DST's pilot *grassroots innovation initiative* in 2016/17 with a R2 million

investment that will focus on supporting innovators and technology entrepreneurs in the informal sector and in marginalised communities)and local plans

- Revenue received for the use of intellectual property (technology receipts) has increased since 2005 to 1260 receipts in 2014 (0.033% of GDP)

Key Finding

- SA's overall innovation performance has improved, but quality of education, higher education enrolments and health still hampering innovation development
- SA's R&D expenditure only 0.73% of total GDP
- Oversight of innovation in LED planning
- Innovative sectors of the economy highlighted such as agro-processing, beneficiation in the mining sector, energy and the blue economy (via Operation Phakisa)

Considerations for KZN Innovation Strategy

- Maths and science education focus to improve SET enrolments in HEIs
- Funding to be cognisant of R&D to improve research outputs, new innovation and manufactured exports

Review of Innovation Strategies of Western Cape, Gauteng and Limpopo

Gauteng, Western Cape and Limpopo have developed their innovation strategies to strengthen regional innovation development efforts. The following table (Table 3) provides comparative review findings of the high-level focus areas of these provincial innovation strategies.

TABLE 3: SUMMARY OF KEY FINDINGS FROM REVIEW OF GAUTENG, WESTERN CAPE, AND LIMPOPO PROVINCIAL INNOVATION STRATEGIES

Gauteng Innovation and Knowledge Economy Strategy 2012	Western Cape Regional Innovation System Strategy 2011	Limpopo Regional Innovation Strategy 2016

• The strategy recognises that innovation "is at the heart of a country's and region's progression along the developmental path" and that innovation and knowledge economy drives economic growth
• Cognisant that governments around the world are broadening and deepening their support for innovation in the private sector and the economy more generally
• Strategy has been developed to "strengthen the national innovation system" through efforts such as improving performance in areas like R&D, education, entrepreneurial activity and knowledge flows
• The strategy is underpinned by three key strategic thrusts namely **economic competitiveness, public sector efficiency and community-led innovation**
	• Need for support from provincial leaders from all four local universities, government, business and industry or private sector".
	• The strategy has four innovation focus areas:
	  ○ **Economy-wide focus on innovation;**
	  ○ **Sector-specific focus on innovation;**
	  ○ **Niche and novelty innovation sectors;**
	  ○ **Entrepreneurial and spatial agglomeration** focuses (such as intermediary institutions or science parks).
	• The strategy provide a guideline on what is required to build and maintain Western Cape's Regional Innovation System, by providing stakeholder roles and responsibilities, a model for the Regional Innovation System, and an Implementation Plan.
	• Some key strategy initiatives include:
		• The Limpopo Regional Innovation Strategy was recently developed (and adopted) by the provincial government.
		• The strategy development process was cognisant of the largely rural nature of the province, and therefore used an **inclusive, bottom-up, and demand (civil society and business) vs supply (government and academia) approach to innovation**.
		• The strategy uses a **four-helix (government, business, academia, civil society) stakeholder engagement approach** to innovation development in the province
		• The **strategy is underpinned mainly by ICT initiatives/ infrastructure**, which is envisaged to create at enabling environment for innovation to succeed in the province.

- Some key strategy initiatives include:
  - Driving innovation via clusters in specific priority sectors;
  - implementation of an "Industry Innovation Unit" to address industrial process innovation and design at an industry scale
  - Incentivising programmes to stimulate appropriate research,
  - The development of an information and knowledge exchange networks,
  - Promotion of high speed Information and Communication Technology (ICT) access at a household level as a means of fast-tracking innovation.

- Build on existing RIS structures and efforts
- Build governance and management structures and capacities
- Establish collaboration structures
- Marketing, communication and participation plan
- Innovation support plan (collaboration fund, innovation competition, pilot support of 2 key sectors)
- Develop a long-term strategy

- Some of the key strategy initiatives include:
  - Innovation awareness campaign
  - Development of key technical and business skills
  - ICT/ telecommunications infrastructure development
  - Develop/ strengthen stakeholder collaboration
  - Public sector focus to develop innovation
  - Provision of incentives/ funding support

Key Finding

- Economic competitiveness, entrepreneurial focus, sector-specific, cluster approach, and inclusive innovation are some of the key strategic areas underpinning the innovation strategies of the Western Cape, Gauteng and Limpopo province

Considerations for KZN Innovation Strategy

- The KZN Innovation Strategy to employ a hybrid innovation system i.e. combining regional and sectoral innovation system concepts. Hence, innovation development in the province proposed to be district sector-specific by districts/ regions in nature

Distinguishing Regional Innovation Systems and Sectoral Innovation Systems

Regional Innovation Systems

Researchers and scholars of innovation systems have developed a regionally-based approach of innovation system thinking, with 'regions' usually referring to a **geographical area** within a country. The research focus in the Regional Systems of Innovation (RSI) concept therefore rests on the relationship between technology, innovation and industrial location (D'Allura, Galvagno, and Mocciaro Li Destri, 2012). The internal organisation of firms, the relationships between firms, the role of the public sector and public policy as well as the institutional set-up of, for example, the financial sector, are amongst the features that can be explored in detail at a regional level.

Sectoral Innovation Systems

Unlike the RIS, which relies on a spatial dimension to define their boundaries, the sectoral innovation system approaches adopt a **certain knowledge system or technology** as their system boundary. The sectoral system of innovation (SSI) concept of Malerba (2003) consists of three building blocks, which are the knowledge and/or technological domain, the actors and networks, and the institutions. The SSI approach has been criticized for its inability to account for the emergence of new technologies and sectors and for its focus on incremental changes.

Regional Innovation Forums

The concept of Regional Innovation Forums (RIF) for South Africa was born out of an initiative of the Department of Science and Technology (DST) to utilize innovation in addressing the problems of inequality, poverty and unemployment in South Africa. The DST's strategic objective is to develop RIFs in each province to help set collective research priorities for the province and to elevate innovation as a driver for economic and social development.

To date, three provincial RIFs have been developed in the Eastern Cape, Western Cape and the Free State, respectively. A brief overview of the structure and performance of the individual RIFs are presented in Table 4 below:

TABLE 4: REVIEW OF PROVINCIAL RIFS (REGIONAL INNOVATION FORA)

	Custodian of RIF	Structure	Key Mandate
Eastern Cape Regional Innovation Forum	Initiative of a number of different stakeholders in the Nelson Mandela Bay / Sarah Baartman District Municipality area, under the auspices of the DST	Steering Committee Innovation information portal membership Networking	The Regional Innovation Forum aims to stimulate, support and promote innovation in the Eastern Cape generally, and in the Nelson Mandela Bay / Sarah Baartman District Municipality area more specifically. This Forum will cover the "Western" region of the Eastern Cape, with further forums to be established in the "Eastern" regions.
Western Cape Regional Innovation Forum	CPUT, in collaboration with the DST, the *Department of Economic Development and Tourism*, local industry and various tertiary institutions within the Western Cape (December 2009)	This forum is aimed at strengthening collaboration between Universities, Research Institutions and the industry as well as government. Primarily it purpose is: • Facilitating RIS strategic planning and regional policy development. • Promote networking amongst RIS stakeholders within the province. • Promote networking amongst RIS stakeholders within the province. • Coordinate Innovation programmes and initiatives within the province. • Create awareness of innovation in the province. • Act as a gateway of innovation programmes and initiative.	The Forum, the theme of which was 'Innovation through Cooperation', has been developed to activate the Regional Innovation System (RIS) by facilitating a comprehensive engagement of Western Cape businesses, institutions and government (collectively known as Triple Helix stakeholders).
Regional Innovation Forum for the Free State (RIFFs)	The Forum (established May 2014) is a DST initiative with the Central University of Technology, Free State (CUT) as custodian	The innovation value chain typically spans across research, concept, design, prototyping, incubation, enterprise development and implementation activities. There are five tasks teams namely, Steering Committee, Awareness, Brainwave and Resources. RIFFS was established around 5 task teams, that together act as an agents for fostering various aspects of the innovation process. RIFFS encompasses these task teams as well as a wide range of stakeholders from within higher education, various spheres of government and business from the Free State Region.	The main aim of the Forum is to enhance the socio-economic status of the region by creating platforms for collaboration and engagement across the innovation value chain spanning research, concept, design, prototype, incubation, enterprise development and implementation.

Key Findings

- Regional Innovation systems and sectoral innovation systems are two differing modes of innovation systems, based on geography and sectors, respectively
- RIFs are a collaborative structure to promote innovation at a regional innovation effort (geographic focus)

Considerations for KZN Innovation Strategy

- Based on the diversity in sectors and prominent spatial differences of the ten districts and one metro of KZN province, a hybrid innovation system that combines both geographic and sectoral innovation focus areas is proposed for KZN province.
- The proposed RIFs will comprise stakeholders to develop innovation efforts based on key sectoral and geographic advantages
- RIFs would be instrumental in promoting creativity and innovation at regional level (including social and inclusive innovation)

Part B – Baseline Study of Innovation in KZN

The *KZN Innovation Baseline Audit* comprised the following methodology (Figure 5 below):

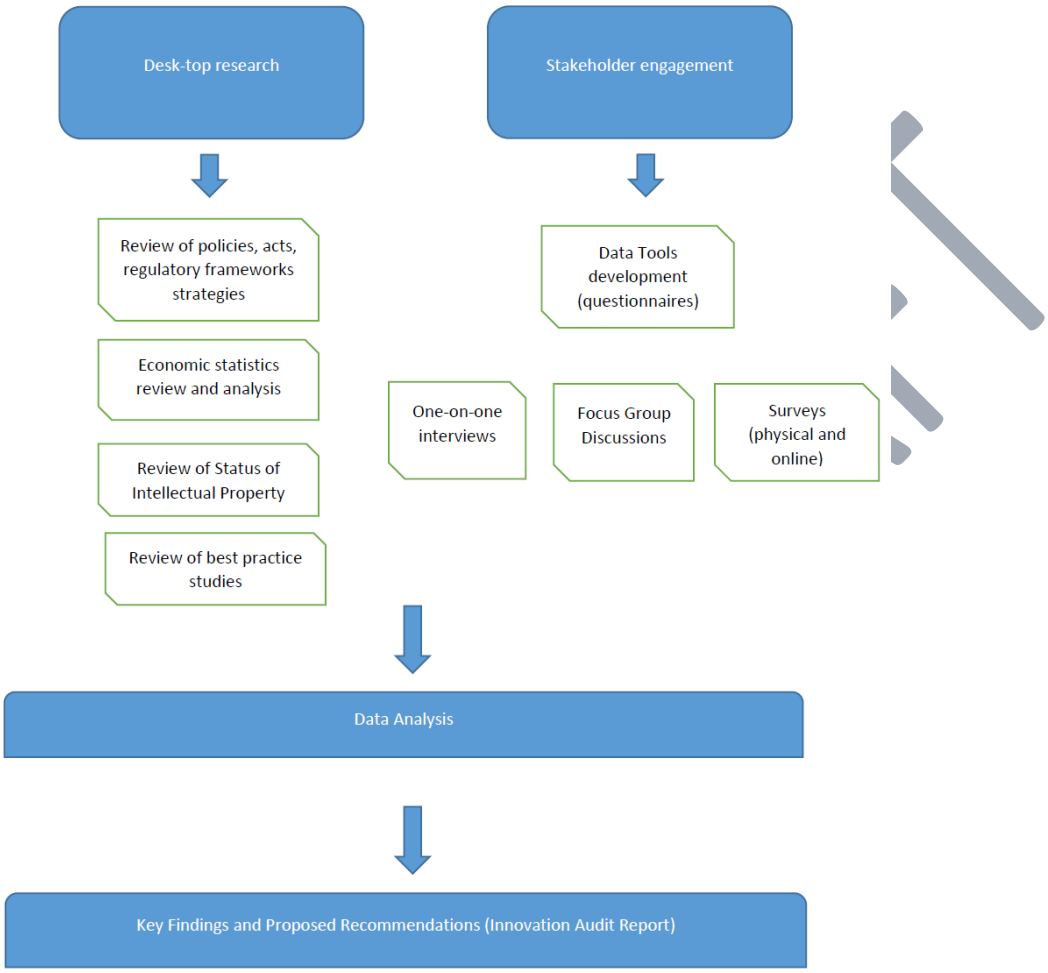


FIGURE 5: METHODOLOGY FOR THE KZN BASELINE INNOVATION AUDIT

A high-level summary of findings of the situational analysis report is provided, with findings segmented by literature review/ desk-top research findings and Stakeholder Engagement Findings:

Our situational analysis report provided a detailed unpacking of the KZN socio-economic status, which affects any economy. We have highlighted the key economic performance statistics from the situational analysis.

Overview of KZN Economic Landscape

Key KZN Economic Plans and the Innovation Imperative

The following table (Table 5) highlights the innovation focus of the province's economic plans

TABLE 5: PROVINCIAL ECONOMIC PLANS AND THE INNOVATION FOCUS

Key Findings - Provincial Policy and Strategy Review	
KZN Provincial Growth and Development Strategy (PGDS) (2011/ draft 2016)	• The PGDS 2011 is currently being reviewed and a draft has been made available for public comment. • Within the Job Creation Goal (revised to Economic Growth in the draft PGDS 2016 revision), the objective **'Develop the knowledge base to enhance the knowledge economy'**, speaks to the development of economic growth through the enhancement of innovation. The revised interventions in the 2016 PGDS review in relation to this objective are - *Establish mechanisms to further strengthen the partnerships between the relevant institutions (R&D) and the provincial system of innovation.* - *Evaluate the performance of operational Innovation and Technology Hubs in KZN so as to draw key lessons from these for the purpose of setting up new effective hubs and a main regional Technology and Innovation hub in the Province.* - *Continue the marketing of KZN as an African Tertiary Education destination but evaluate the impact of past marketing efforts and the vulnerability of the marketing strategy to funding sources and changes of such funding by international funders.* - *Grow R&D in areas where the province has currently a strong R&D platform or strong potential or prospect (e.g. some agricultural sub-sectors, traditional medicine).* - *Support the commercialisation of R&D.* • Within the Strategic Infrastructure goal, the objective '**Development of information and communications technology'** highlights the need for ICT infrastructure in order to address the developmental needs of the Province. The revised interventions in the 2016 PGDS review in relation to this objective are: - *Expand community access to broadband services.* - *Increase bandwidth (speed) for economic competitiveness.* - *Develop ICT Maintenance Plan.* - *Develop and Implement ICT Skills training Programme at local level.* - *Develop and implement an ICT funding model.*
KZN Investment Strategy 2011	• The strategy provides 5 strategic thrusts to promote, attract and facilitate investment into the province. • Within Strategic Thrust 2 (Focused Investment Promotion), the Strategy provides key sectors for targeted investment promotion, which includes the "**Knowledge, Innovation and Green Economy Sectors"** (KZN Investment Strategy, 2011: 25).
KZN State of the Province Address (2016)	• Within the KZN State of the Province Address (SOPA) 2016, key issues were mentioned that included: - Lower than expected economic growth rate - High crime rates and corruption - Levels of poverty, unemployment and inequality still very high - Declining matric pass rate - High rate of HIV infections - The need to reduce public spending • Roll out of the nine-point plan for the province that includes Dube Trade Port and Richards Bay IDZ – designated SEZs for investment and export and identified as key for the success of the Operation Phakisa and the KZN Aerotropolis Strategy, and a number of key initiatives

Key Finding
Current economic plans for the province motivate for the need for improved competitiveness (innovation) to be an important ingredient in growing the economy

Considerations for KZN Innovation Strategy
The strategy to be aligned and support key economic plans for the province

KZN GDP and Sector Statistics

While KwaZulu-Natal, with 10,9million residents, accounted for 20% of South Africa's population in 2014/2015, it **contributed just 16% of the GDP**. In 2014 – the latest available data – the real economy

(represented here by agriculture, mining, manufacturing and construction) made up 25% of KwaZulu-Natal's output.

The **largest real-economy sector was manufacturing, at 16%** of the provincial economy, followed by agriculture at 3%, construction at 4%, and mining at 2%. KwaZulu-Natal contributed 22% of national manufacturing, 25% of national agriculture, 19% of national construction, but only 3% of national mining.

Of the main real economy sectors, **the fastest growing in KwaZulu Natal was construction**. The province benefited from major rail, road and port projects under the National Infrastructure Plan. In contrast, manufacturing saw particularly slow growth from 2011 to 2014, at just over 1% a year.

Employment

KwaZulu-Natal has relatively high levels of joblessness. **Just 38% of the working-age population was employed in 2015**, compared to a national average of over 40%. The international norm is around 60%.

For the year ended September 2016, employment losses were recorded in six of the nine provinces. KwaZulu-Natal, North West and Free State recorded the largest declines (77 000, 22 000 and 14 000 respectively). (Stats SA – Quarter 3, 2016). **The official unemployment rate (people who take active steps to find employment, but fail to do so) as at end September 2016 was 23.5 % (20.2% for eThekwini and 26.1% for non-metro), whilst the expanded unemployment rate (including people who desire employment, whether job-seeking or not) rate sitting at 40.4% (28.4% for eThekwini and 47.8% for non-metro) for this period.**

The following chart (Figure 6) shows the change in employment by major sector in the real economy in 2008, 2011 and 2015, using the average of quarterly figures for each year. Employment in manufacturing declined steadily over the period, while construction increased. The number of farmworkers fluctuated, and has likely declined more recently due to the drought.

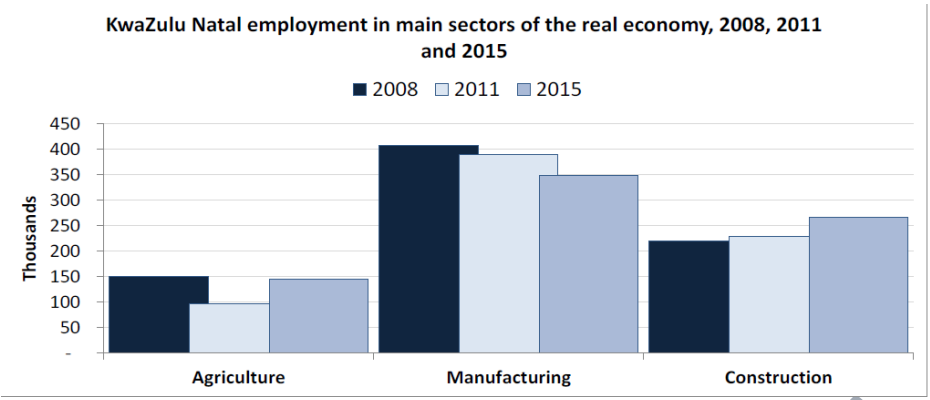


FIGURE 6: KZN EMPLOYMENT BY PREDOMINANT SECTOR (2008 VS 2015)

KwaZulu-Natal accounted for 20% of South African manufacturing employment. The top five manufacturing industries in the province, in terms of employment, were **clothing, textiles and footwear; food and beverages; basic iron and steel and metal products; chemicals and plastic; and paper and publishing**. The province accounted for **41% of employment in clothing, textiles and footwear, its largest manufacturing industry.** But the **main growth in manufacturing jobs came from food and beverages.**

Key Provincial Economic Development Initiatives

In terms of *Department of Trade and Industry (the dti)* support, from 2013/2014 to 2014/2015, a total of 107 projects were approved under the *Manufacturing Competitiveness Enhancement Programme (MCEP)* in KwaZulu Natal, for a total value of just over R500 million. A further 74 projects were approved under the *Manufacturing Investment Programme (MIP),* with a value of R195 million. The province also benefited strongly from sectoral programmes included in the Industrial Policy Action Plan (IPAP), including for clothing and textiles, the aluminium foundries. KwaZulu-Natal has two actual **Industrial Development** and **Special Economic Zones (Table 6 below):**

TABLE 6: KZN IDZ AND SEZS AND FOCUS AREAS

Industrial Development and Special Economic Zones in KwaZulu-Natal IDZ/SEZs	Focus
Richards Bay	Aluminium; titanium; dry dock (ship and repair); and furniture
Dube Trade Port	Value niche aquaculture and horticulture; automotive; electronics; and fashion garments

Some Major public and private projects

Some recent major public and private projects in the province, is listed in Table 7 below

TABLE 7: SOME MAJOR PUBLIC AND PRIVATE PROJECTS IN KZN

Large recent public and private real-economy projects in KwaZulu Natal

Project Name	Company	Value	Sector	Industry
Cornubia Mixed Use Development	Tongaat Hulett Developments and eThekwini Municipality	R20 billion	Mixed	Construction
Clairwood Logistics Park and Distribution Centre	Fortress Income Fund	R3,5 billion	Private	Construction
Tyre manufacturing plant upgrade and expansion	Sumitomo Rubber South Africa	R2 billion	Private	Manufacturing

KZN Key Catalytic Projects

Opportunities for innovation lay within various catalytic projects, but particularly within the Richards Bay IDZ and port development, Dube Tradeport and Aerotropolis development, and Durban Dig-Out Port development, which are arguably the largest of these catalytic projects. Figure 7 (below) displays the key catalytic projects earmarked for economic development in the province as per the *Provincial Growth and Development Strategy.*

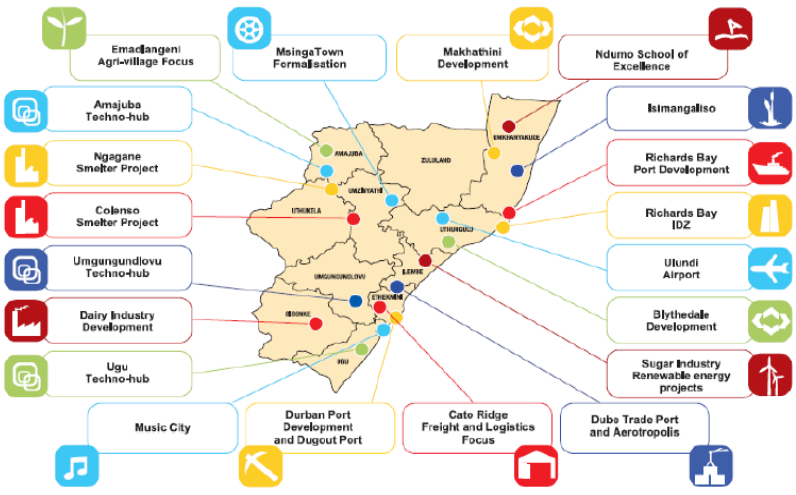


FIGURE 7: KZN KEY CATALYTIC PROJECTS (SOURCE: KZN PROVINCIAL PLANNING COMMISSION 2016)

The role of innovation to expedite the delivery and implementation of the abovementioned key catalytic projects in a manner that is efficient, cost-effective and effective cannot be

overemphasized. However, KZN (like the rest of South Africa) suffers from a critical shortage of professional/ high-end skills, such as engineering and project management, which are critical for economic growth, including the key catalytic projects highlighted above. The lack of / access to higher education institutions in certain districts in Kwazulu-Natal (such as Amajuba District, Harry Gwala District, Umzinyathi District), to support the development of key critical skills. All existing HEIs should consider championing the production of relevant skills for innovation across the province (that is not limited to a particular geographic region).

KZN Export vs Import Trends

Some key KZN export and import trends are highlighted below:

- KZN exports 10.4% of SA's total exports (third highest in SA)
- Whilst KZN exports have grown steadily over last 5 years, KZN (and SA's) **imports have been consistently greater than exports over the last 5 years**
- **KZN's export (grey figure) vs import products (blue figure) for 2015 are listed in Figure 8 below**

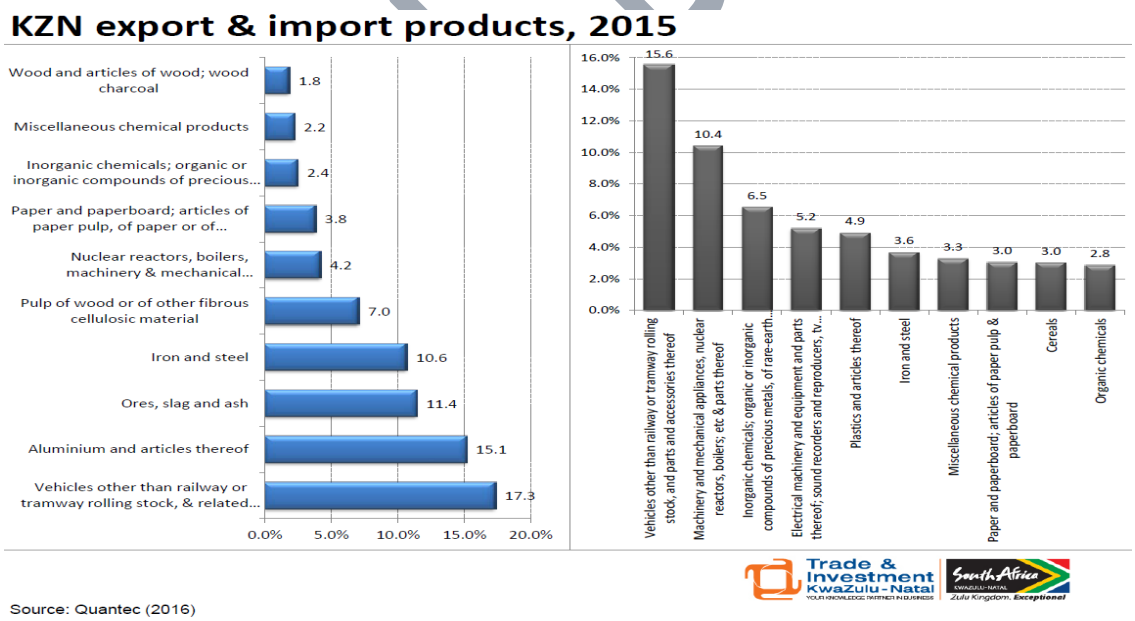


FIGURE 8: KZN EXPORT VS IMPORT PRODUCTS FOR 2015 (SOURCE TIKZN)

Some KZN Import Opportunities for Local Beneficiation

Some key opportunities for local beneficiation are presented below:

- KZN is prioritizing localization in line with IPAP initiatives and the NDP
- Automotive components have been reviewed for localisation opportunity alongside enablers and blockages
- Despite recent low growth, localisation, downstream beneficiation and export led investment opportunities exist within the chemicals and clothing and textile manufacture sector in KZN
- There is a need to intensify research and development support for product development, innovation, and commercialization within the manufacturing sector
- Within the agricultural sector, there is a need to establish government partnerships and introduce the knowledge transfer (e.g. Brazil in Soya beans) and exploring new models for land reform
- Within the manufacturing sector, knowledge transfer between government, industry with China, Brazil is key
- Within mining, there increased beneficiation opportunities of key minerals
- The opportunity arises for economic transformation and for participation in the *Black Industrialist Programme*

Key Findings

- KZN imports greater than exports
- Opportunities for import substitution, localisation, downstream beneficiation and export led investment in key sectors of the economy, such as agriculture and agroprocessing and manufacturing (automotive, chemical, clothing and textile) and other
- Economic transformation is prioritised by focusing/ preferencing local and black-empowered enterprises (through initiatives such as Black Industrialists program and other grant funding such as DTI SPII)

Considerations for KZN Innovation Strategy

- Enhancing competitiveness through knowledge transfer in key , improving R&D spend in key sectors, targeted and specialised skills development, innovation incentives for enterprise, focused enterprise development, reducing the red tape and improving business TATs is critical to enhance our export capabilities and competitiveness
- There exists the need to aligning localisation efforts to include innovation as a key catalyst for development

Review of Key and Proposed Targeted Sectors for Innovation Development by District/ Metro '

Table 8 provides a review of the district and metro's priority sectors (as per the PGDP), key catalytic projects, the key comparative advantages sectors of each district/ metro, key spatial considerations and advantages, as well as proposed sectors (last column) for innovation focus. The key sectors that are existing and stable are highlighted in bold font and emerging sectors/ sectors for consideration for innovation development highlighted in green.

TABLE 8: REVIEW OF KZN DISTRICT/ METRO KEY SECTORS FOR INNOVATION DEVELOPMENT

Priority sectors as per PGDP	Key catalytic projects (current/ planned)	Key Comparative Advantage Sectors (*District Comparative Advantates Report, 2012*)	**Spatial Considerations** *District Comparative Advantages Report, 2012)*	**Existing and Stable Sectors (bold) and Emerging Sectors (green)** *District Comparative Advantates Report, 2012)*
eThekwini Metropolitan				
Ocean Economy Manufacturing	Dube Trade Port and Aerotropolis Durban Port Development and Dugout Port Renewable Energy Park Cato Ridge Freight and Logistics focus Automotive Supplier Park Durban Film Studio Inyaninga Integrated Human Settlement	• Manufacturing (of transport equipment, electronics, medical/ other appliances • Air Transport & transport supporting activities • Finance, insurance, real estate and business services	• the spatial distribution of economic activity is skewed towards the Durban City Centre, the South Durban Basin, the Port of Durban and the Pinetown and New Germany areas and the Northern corridor • The tourism sector is mainly concentrated along the coast • Historically the Durban CBD was the location of the retail and commercial sectors, but this has changed over the past 30 years to the north of Durban. • Key industrial development of note in eThekwini is Dube Trade Port	• **Chemical manufacturing** • **Transport, trade and logistics** • Automotive Manufacturing • Finance and Insurance • Tourism (events) • Agro-processing • Green Economy (manufacturing) • Air Transport • Ocean Economy • ICT (Smart City readiness)
iLembe District Municipality				
Agriculture Tourism Community services	Sugar industry Renewable Energy Projects	• Manufacturing • Agriculture (agroprocessing)	• iLembe is located on the eThekwini-Umhlatuze Corridor, a corridor which is viewed, in terms of the 2006 PSEDS, as a priority development corridor in KwaZulu-Natal. • Major formal commercial centres in the District includes KwaDukuza, Ballito and Mandeni / Sundumbili, with industrial activity concentrated in Stanger and Isithebe in Mandeni as well as at the various sugar and paper mills • Agriculture in the area is dominated by sugar cane production • The rural nodes of the Ndwedwe and Maphumulo Municipalities are underdeveloped	• **Agriculture (sugar cane)** • Agro-processing • Wood processing, • Beach resort tourism • Property development and real estate • Green Economy
Amajuba District				
Manufacturing **Community services** **Financial and business services**	Emadlangeni Agri-village focus Amajuba Technohub Ngagane Smelter project Manipal Medical Training Facility	• Manufacturing (of metal products) • Coal Mining	• Newcastle-Madadeni-Osisweni is the key economic node of the district • Amajuba is a gateway to the Free State and (especially) Mpumalanga • The N11 connects Mpumalanga with the N3:	• **Metals manufacturing** and metals beneficiation • **Coal mining** • **Textile and clothing** • Chemical manufacturing

				• Wholesale, retail and trade • Agriculture and agro-processing • ICT (owing to KZN Technohub)
Ugu District				
Manufacturing **Agriculture, forestry and fishing** **Construction**	Ugu Technohub Music City Finningley Growth Sphere	• Agriculture and hunting • Forestry and Logging • Wood and wood products manufacture • Tourism and hospitality (hotels and restaurants)	• An operational rail system stretches along the coast • 70% of district economic activity is concentrated in the Port Shepstone / Margate area • The tourism sector is well-developed along the coast • Rural nodes in three of the six municipalities are underdeveloped • Forestry plantations dominate land use in the western parts • Agricultural activity is generally confined to the coastal strip and inland	• **Forestry and timber production** • Agriculture • **Tourism and hospitality** • **Food beverages and tobacco processing** • Post and telecommunications • Wood processing • ICT (owing to telecoms and KZN Technohub)
Umgungundlovu District Municipality				
Manufacturing **Agriculture, forestry and fishing** **Wholesale and retail trade**	Umgungundlovu Technohub Greater Dukuduku project	• Agriculture and hunting • Forestry and Logging • Public Administration	• Houses the administrative and legislative centre of the provincial government • Urban centres outside of Pietermaritzburg include Howick • The district is further characterised by commercial farming operations • large areas of land owned by the Ingonyama Trust Board and occupied by traditional communities. • Areas of land have been set aside in the district for conservation (private and state)	• **Forestry and timber production** • Agriculture and hunting • Public administration • Post and telecommunications • Agro-processing • ICT (owing to KZN Technohub)
Zululand District				
Storage and communication **Agriculture, forestry and fishing** **Manufacturing**		• Agriculture and hunting • Forestry and Logging • Mining	• More than 50% reside in Nongoma and Ulundi in mainly traditional settlement areas • Ulundi and Nongoma Municipalities are regarded as two of the poorest rural municipalities in South Africa • District is divided nearly equally between commercial agriculture and traditional settlement areas • Historically the Zululand District has been isolated, in some respects referred to as a cul-de-sac, because of limited linkages to both the coast and the north	• Agriculture and hunting • **Forestry and Logging** • Meat and skin processing • Mining beneficiation (coal and anthracite) • Cultural tourism
Umzinyathi District				
Agriculture, hunting, forestry and fishing **Wholesale and retail trade** **Manufacturing**	Msinga Town formalisation	• Agriculture and hunting • Forestry and Logging • Mining	• Greytown, one of the district's main economic hubs • The District is made up of four Local Municipalities each with distinct development features • The topography and soil conditions in the central parts of the District, including large parts of Msinga and Nqutu, are an impediment to future agricultural development	• Agriculture and hunting • Forestry and Logging • Tourism (Battlefields) • Food and beverages (livestock processing)Mining beneficiation (coal and anthracite)
uMkhanyakude District				

Agriculture, trade, tourism	Isimangaliso Makathini development Ndumo School of Excellence	• Agriculture and hunting • Forestry and logging	• Shares international borders with two countries: Mozambique and Swaziland • The dominant land tenure is communal tenure under Ingonyama Trust. • 21% is under proclaimed conservation area • Lack of industrial development of any kind • Only formal towns being Mtubatuba, Hluhluwe and Mkuze • Reliance on the riverine and wetland systems for water and agricultural production,	• Tourism • Agriculture and hunting • Wholesale and retail trade • Green economy (alternative energy)
Harry Gwala District				
Agriculture Community services	Dairy Industry Development	• Agriculture and hunting	• Ixopo, Underberg-Himeville, Creighton, Umzimkulu; Bulwer and Kokstad are the key economic development nodes • Characterised by limited formal urban development • Commercial agriculture is extensive throughout • main focal area for tourism is the Drakensberg	• Agriculture and hunting • Retail trade and services to Eastern Cape • Agro-processing (dairy) • Tourism
King Cetshwayo District				
Manufacturing Mining Community services	• Blythedale development • Richards Bay port development • Richards Bay IDZ • Ulundi airport • Richards Bay Technohub	• Manufacturing • Mining	• Commercial and industrial economic activity is concentrated along the coastal corridor, centred around Richards Bay and Empangeni. • Richards Bay, originally established as a focus of heavy industry, provides a base for downstream economic activity • N2 along the coast is the primary transportation corridor • Large areas of communally held land under the jurisdiction of the Ingonyama Trust Board. • The agricultural potential in these areas is largely underutilised.	• **Forestry and logging** • **Wood processing** • **Metal and machinery manufacture** • **Land and water transport** • Construction and engineering • Agriculture and agri-processing • ICT (owing to RB IDZ and Technohub)
Uthukela District				
Manufacturing wholesale and retail trade, catering and accommodation	• Thukela Agrihub • Colenso Smelter project	• Manufacturing • Agriculture • Finance and Business • Wholesale and Retail Trade	• Ladysmith-Ezakheni (greater Ladysmith), Estcourt, Bergville and Winterton as the economic development nodes • The N3 passes through the centre of the district • The functional national rail route connects Gauteng, Newcastle and Ladysmith to Ethekwini. • There are large areas of the district which are owned by the Ingonyama Trust Board which are under rural settlement and limited subsistence agriculture. • The land use in the higher western areas of the district is extensive crop production	• **Land and Water Transport** • **Food and beverage processing (Pork products and chocolate drinks)** • **Agriculture and Hunting** • Clothing and textiles • Renewable energies

Key Findings

- KZN is diverse province with respect to the distinctly different and varying geographic attributes and sectoral profiles of each district and metro.
- There are a number of key district comparative advantages with respect to sector and spatial attributes

Considerations for KZN Innovation Strategy

- The KZN Innovation strategy needs be cognisant of the diversity of sectors (both existing and emerging) and the innovation focus required to develop the knowledge profiles of each, create jobs and strengthen the economic growth of the province
- Key consideration to be given to innovation development of sectors that are existing and stable (bold) and emerging/ or considered for development based on key catalytic projects/ PGDP priorities (green) to strengthen efforts to grow the KZN economy

Review of KZN Education: Matric Maths and Science Results and HEI SET Enrolments

Our economy is highly dependent on our ability to add value, through scientific, engineering and technological innovation – and through advanced manufacturing skills. Maximising the potential in the areas of science, mathematics, creativity and innovation remains critical for South Africa to compete in a globally competitive environment. However, the latest *Trends in International Maths and Science Study (TIMSS)* results for 2015 placed South Africa second worst in the world (improvement from worst in the world last year). The TIMSS results show that South Africa was ranked second last out of 48 countries for Grade 4 mathematics, second last for Grade 8 mathematics and stone last for Grade 8 science out of 38 countries. The country did not participate in Grade 4 science.

A high level review of KZN's maths and science performance by our matriculants in 2015, showed that our province was one of the worst performers in **mathematics in the country with just 20%,** of learners in achieving a mark of 40% or more, whilst just **30.2% of learners** in KwaZulu-Natal achieved a grade of 40% or more **for physical science.**

With respect to science, engineering and technology (SET) e**nrolments within the Higher Education Sector in KZN, revealed the following (Table 9):**

TABLE 9: SET ENROLMENTS (2014) BY HEI IN KZN

Higher Education Institute	Location	SET Enrolments (2014)
1. University of Kwazulu-Natal	eThekwini Municipality	39.3%
2. University of Zululand	Zululand District Municipality	18.8%
3. Durban University of Technology	eThekwini Municipality	48.9%
4. Mangosuthu University of Technology	eThekwini Municipality	61.2%

SET enrolments were 39.3% (UKZN), 48.9% (DUT), 61.2% (MUT), respectively with Unizulu the lowest at 18.8% of SET enrolments. The national average SET enrolments during the 2014 period was 29.6%.

Key Finding

- Matric maths and science results in KZN amongst the lowest in the country
- Unizulu lowest SET enrolments in the province

Considerations for KZN Innovation Strategy

- Maths and science education to be prioritised in KZN, that includes identifying creative methods for accessible, effective teaching and learning to improve results
- Extra effort to be placed on improving SET enrolments in Unizulu

KZN's R&D Expenditure (as a % of GDP)

The HSRC *South African National Survey for Research and Experimental Development* 2013/14 report was used for the review of R&D expenditure of KZN (and South Africa), by key sector type, i.e. government, science councils, higher education, business and not-for-profit. The following key highlights can be summarized:

- SA's R&D expenditure as a % of GDP decreased to 0.73% in 2013/14 (from 0.81%) in 2004/5.
- Business consistently remained the most significant contributor to R&D expenditure in the country
- KZN had the third-highest R&D expenditure in the country at 10.7% to Gauteng's 46.7% expenditure and Western Cape's 19.3% expenditure
- KZN HEI R&D Expenditure (UKZN ranked number three in the country and regionally in the Academic Ranking of World Universities 2010. Further, the University is one of the most prolific with respect to the number of articles published during the 2005-2014 period)

- KZN's key sector R&D expenditure (2013/14 vs 2004/5) is as follows:

TABLE 10: KZN R&D EXPENDITURE (2004/5 VS 2013/14)

	KZN				South Africa			
	2004/5		2013/14		2004/5		2013/14	
	R(000)		R(000)	%increase	R(000)		R(000)	
Business	615 437		1 434 984		6 766 361		11 782 848	
Not-for profit	37 729		166 603		198 268		583 165	
Government	31 213		161 962		515 331		1 697 151	
Science councils	171 424		239 387		1 996 050		4 304 556	
HEIs	373 595		1 137 258		2 533 971		7 292 853	
	1 229 397		2 752 543		12009 982		25 660 573	

Status of Patent Application Statistics in the Province

The following (non HEI) patent application data (Figure 9, 10) for KZN province was provided by CIPC. There appears to be limited effective complete measure of innovation statistics for patent filing segmented at a provincial level.

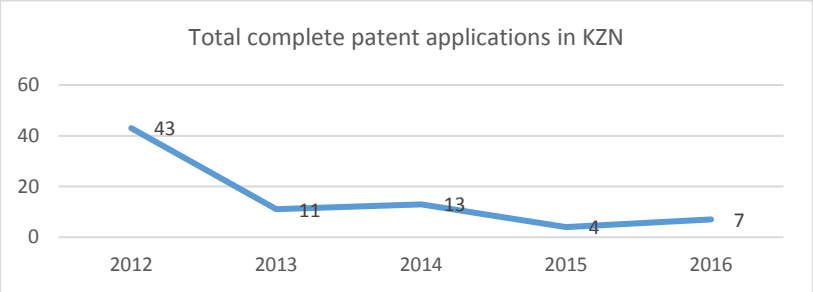


FIGURE 9: TOTAL COMPLETE PATENT APPLICATION FOR KZN, 2012-2016 (SOURCE: CIPC)

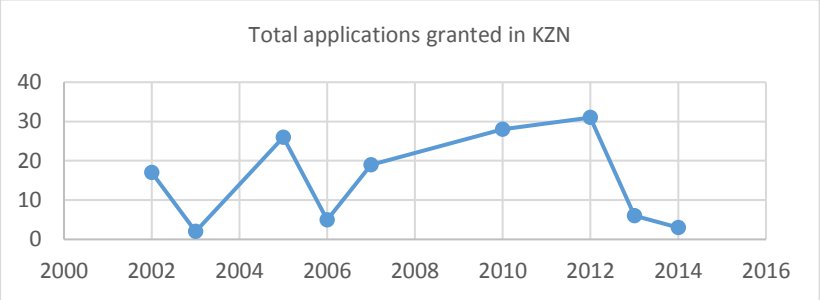


FIGURE 10: TOTAL APPLICATIONS GRANTED IN KZN, 2002- 2016 (SOURCE: CIPC)

Key Finding

- Consistently low KZN R&D expenditure, hence fewer research and innovation outputs
- Patent data (HEI and non HEI) for KZN not consolidated nor readily available

Considerations for KZN Innovation Strategy

- Coordinated patent database in the province
- The need to promote greater investment in R&D across the key stakeholder

KZN Innovation Ecosystem

The concept of an innovation ecosystem often stresses that innovation occurs through interactive networks at various levels (Council on Competitiveness, 2004; Lansiti & Levien, 2004; Industrial Structure Council, 2005; *Organisation for Economic Co-operation and Development [OECD],* 2008). These networks are a broad and complex array of stakeholders in both of public and private sectors. **An important function of innovation ecosystem consists of governmental organizations that fund R&D activities, many areas of policy which impact the effectiveness of innovation, large and small firms who transform research and new knowledge into the market place, universities, research institutes, and different kinds of infrastructure such as transportation and telecommunications. All stakeholders are related to one another in a complex manner in innovation processes as a part of an innovation ecosystem.** Their behaviours improve the performance of an ecosystem and, in doing so, improve individual performances. Additionally it was found that for stakeholder engagement to be effective, the engagement needed to reduce red tape and bureaucracy, allowing for agility and ability to implement.

Hence, whilst stakeholder roles have been articulated with respect to the KZN Innovation Strategy (refer Section on Stakeholder Roles and Responsibilities below), there exists the need to strengthen the innovation priority in the province and effective stakeholder partnerships to create an effective innovation ecosystem.

Key Innovation Stakeholders

Unpacking Innovation Stakeholders by Type

The current key innovation stakeholders found within the KZN landscape, (segmented by public sector, private sector, academia and civil society), is diagrammatically illustrated in Figure 11 below:

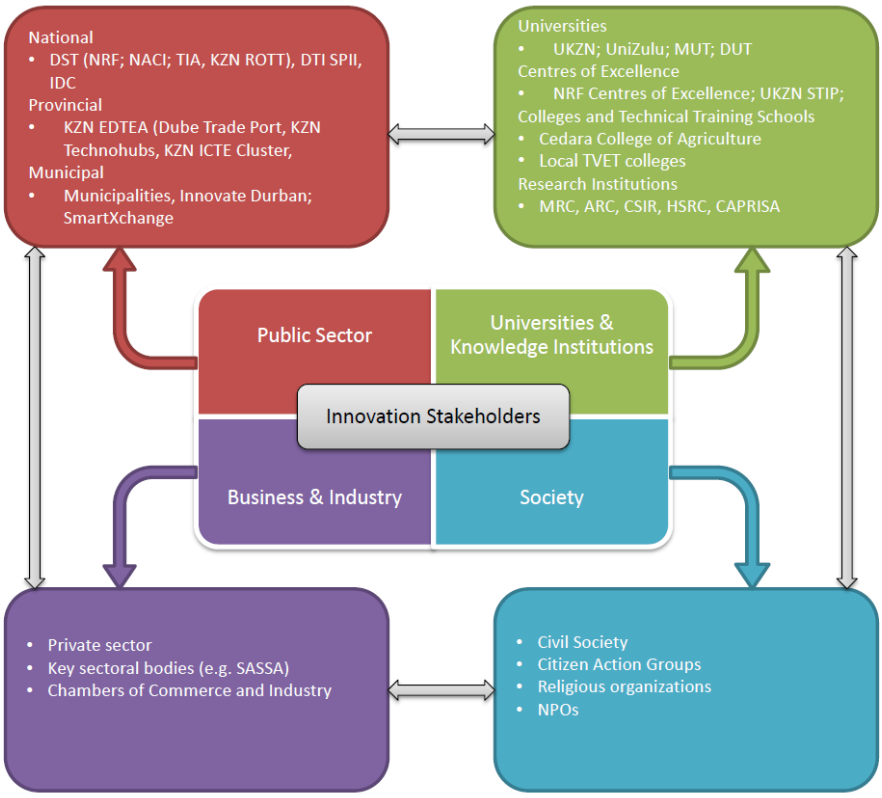


FIGURE 11: KZN INNOVATION ROLEPLAYERS

Key Finding

- There are a number of innovation stakeholders with varying innovation mandates with respect to innovation development in the province
- Engagements with key stakeholders have highlighted a limited integrated approach to innovation development in the province

Considerations for KZN Innovation Strategy

- There is a need for a cohesive framework/ innovation ecosystem for KZN province's innovation development needs

KZN's Innovation Funding Landscape

The following table (Table 11) highlights the main innovation funders in KZN, together with description of the fund and type of funding support (iro of the innovation value chain):

TABLE 11: KZN INNOVATION FUNDING LANDSCAPE

Funder	Description	Funding support type across the Innovation Value Chain (refer Annexure a for description)
TIA Funding:	TIA will provide funding for ideas developed from any sector of the economy where: there exists innovative technology-based ideas for either new or improved products, processes or services; • technologies are developed from proof of concept to pre-commercialisation demonstration; • technologies require facilitation for commercialisation at; • inbound technologies can be further improved, developed and exploited by South Africans themselves or in collaboration with international partners. • there is an opportunity for the promotion and development of capacity to reduce barriers to technological innovation in South Africa through the Technology Stations and Technology Platforms Programmes.	Across the innovation value chain
TIA Seed Fund (incl SmartXchange TIA Innovation Seed Fund for Media; Information Communication Technology & Electronics (MICTe) innovations, DUT TIA Seed Fund)	To assist innovators at higher education institutions and SMMEs to advance their research outputs and ideas from proof of concept to pre-commercialisation. Grant funding up to R1million per application. Benefits are: • Access to finance at a high-risk stage • SMMEs develop and grow asset base • Quick turnaround time for funding	Idea Generation Idea Conversion
TIA Technology Development Fund	For Technology development and prototype support	Idea Conversion
TIA Commercialisation Support Fund	To prepare innovators for follow-on funding, through limited support for market testing and validation. In this instance, TIA's role is to connect technology innovators to onward business and investment opportunities.	Idea Diffusion
DTI SPII Fund	The Support Programme for Industrial Innovation (SPII) is designed to promote technology development in South Africa's industry, through the provision of financial assistance for the development of innovative products and/or processes. SPII is focussed specifically on the development phase, which begins at the conclusion of basic research and ends at the point when a pre-production prototype has been produced. The SPII offers two schemes namely, the: • SPII Product Process Development (PPD) Scheme; (Provides financial assistance to small, very small and micro-enterprises and individuals in the form of a non-repayable grant.) and • SPII Matching Scheme (provides financial assistance to all enterprises and individuals in the form of a non-repayable grant)	Idea Generation - Conversion
THRIP	The Technology and Human Resources for Industry Programme (THRIP) is a partnership programme which challenges companies to match government funding for innovative research and development in South Africa. Managed by the National Research	Idea Generation - Conversion

	Foundation (NRF) on behalf of the Department of Trade and Industry (the dti), THRIP gives local industry the means to obtain specific responses to its technology needs, by unleashing the potential of our students, researchers, and science and technology experts. • THRIP's objectives and priorities ensure that projects not only result in competitive, world-class technologies, but that they also support the growth and transformation of the rainbow nation. • THRIP focuses on projects that specifically promote and facilitate scientific research, technology development and technology diffusion, or any combination of these. • All projects funded by THRIP must include human resource development, but the choice of technological focus is left to the industrial participants and their partners. • The industry and the dti share the costs – and therefore the risk – of developing commercial technology on a R2 to R1 basis (industry: the dti). The dti's support may be doubled if a project supports certain THRIP priorities.	
SA Green Fund	The Green Fund is a unique, newly established national fund that seeks to support green initiatives to assist South Africa's transition to a low carbon, resource efficient and climate resilient development path delivering high impact economic, environmental and social benefits. The Fund is managed by the Development of Bank of South Africa (DBSA) on behalf of Department of Environmental Affairs. The Fund will respond to market weaknesses currently hampering South Africa's transition to a green economy by promoting innovative and high impact green programmes and projects	Across the innovation value chain
KZN Technology Transfer Fund	The objective of the Fund is to support the development of commercially viable technology innovations, to facilitate and support the development of a knowledge base to enhance the knowledge economy and to promote public private partnerships that assist in bridging financing gaps and help translate university research outputs into fundable ideas for commercialization. • All sectors of the economy are eligible for support that have a high potential to boost employment, but not limited to: Agro-processing, Tourism, Clothing and textiles, Wood and wood products, Arts, crafts, cultural and creative industries, Automotive and components industry, Chemicals industry, Green economy initiatives, Any other sector relevant to KZN • A maximum amount of R500 000 will be allocated per transaction in the first year with a possibility of review in the following two years of the partnership. Consideration will however be given to transactions that warrant funding exceeding R500 000 but should not exceed R1 000 000.	Innovation conversion and diffusion
SEDA Technology Transfer Fund	The main purpose of the TTF is to specifically fund defined components of the process of transferring available technology to entrepreneurs, communities and existing South African businesses, focusing on the second economy. The TTF will provide funding to enable technology transfer for the second economy as a grant with no payback up to a maximum of R500 000 per project.	Innovation conversion and diffusion
Business Partners Limited Venture Capital Fund	Business Partners Limited Venture Capital Fund - Business Partners recognises the potential benefit that innovative and high risk growth enterprises can bring to the country. Hence, the launch the Business Partners Limited Venture Fund, a fund aimed at financing high impact entrepreneurs. The fund purpose is: • The financing of a new product / concept or taking a new initiative to market • Financing of a business where job creation is substantial and will create substantial jobs due to this finance • Albeit more risky, Business Partners may invest in transactions where blue sky potential exists • A well-structured BEE transaction where wealth creation and possibly transfer of skills exists • A financial transaction to take an existing business to the next level, resulting in a significant increase in activities • Financing of businesses that will result in import replacement • Financing of businesses to introduce or increase exports • The financing of high technological projects • Transactions where transfer of skills are facilitated in particular to previously disadvantaged entrepreneurs	Innovation diffusion

Private Sector (CSI initiatives such as SAB Foundation Social Innovation Awards)	The SAB Foundation Social Innovation Awards was launched in 2011 as part of the SAB Foundation's primary focus to ignite a culture of entrepreneurship in South Africa. The competition plans to recognise the work of entrepreneurs who are finding innovative business solutions to challenges facing some of South Africa's most vulnerable people like women, youth, the disabled and those living in rural areas. It serves as a catalyst for social change in rural communities through its investments in innovative products and service. The SAB Foundation Social Innovation Awards offers a prize for sustainable innovation, either a product or process that addresses a challenge faced by its beneficiary groups. Emphasis is placed on innovations that are scalable and able to be commercialised. Prizes consist of the following: • 1st place R1.2 million • 2ndplace R600 000 • 3rdplace R400 000 • Several developmental awards are awarded to deserving innovations	Idea conversion and diffusion

Key Finding

- There are various funders that support innovation within the KZN innovation landscape
- Not enough awareness of KZN's innovation funding landscape
- The need for additional funding to be invested in innovation across the value chain (as identified during stakeholder engagements)

Considerations for KZN Innovation Strategy

- Increasing knowledge and awareness of funding platforms for innovation
- The need for accessing alternative and new sources for funding

Some Key KZN Innovation Initiatives

An in-depth review of key innovation/ICT projects planned for the province is summarized below (Table 12):

TABLE 12: SUMMARY OF KEY FINDINGS OF KZN INNOVATION PROJECTS AND KEY CATALYTIC PROJECTS

Key KwaZulu-Natal Innovation Initiatives	
Some key KZN Innovation Initiatives	**Key Innovation Projects (Existing and Planned)** • **TIA Technology Stations in existence at DUT (Reinforced Material and Plastics) and MUT (Chemicals), respectively. The intention of these stations are to provide the platform and infrastructure and support for R&D and commercialisation in the respective sectors. In addition, TIA has a bioprocessing platform, based in Umbogintwini (South of Durban) that provides technical and infrastructure support to support bioprocessing development** • **CSIR TLIU** - TLIU is an initiative of the Department of Science and Technology (DST) which is hosted and incubated at the Council of Scientific and Industrial Research (CSIR) within the Strategic Initiatives and Implementation Unit (SIIU). TLIU was formed by DST to implement the deliverables of its Technology Localisation Plan (TLP) **which include, amongst other objectives, skills enhancement and the creation of sustainable job opportunities. The main objective of the TLIU SET Internship Programme (partnership between TLIU and SASCE - SASCE is a body that has been formed by the universities of technology (UoT), universities, TVET Colleges, private colleges, organised business and labour. is to increase the graduation rate of science and engineering students through the provision of structured practical work exposure and training opportunities. Ten universities in SA are active participants in the TLIU SETIIP, including DUT and MUT** • **SEDA Tech Incubators** - The STP specifically targets entrepreneurs who want to develop their businesses through innovation and technology. Not only do these incubators provide necessary business infrastructure and strategic guidance, but also an environment of learning and sharing in which information, experiences and ideas are freely exchanged. This builds entrepreneurs' skills and knowledge bases, better preparing them for business in the open market, with a view to increasing profitability and growth. Examples are Furntech (Durban),SEDA DUT (Invotech) • **Invotech,** - a SEDA and DUT partnership program, is designed to assist South African entrepreneurs to develop their innovative ideas into viable businesses, providing incubator support over a 10 week period. To qualify the product must be part of the Green Technology, Digital Creative Industry, Software or Mobile Application Sectors. The blended programme comprises of Instruction, Mentoring, Technical Support, and support with commercialization. The programme introduce entrepreneurs to the concept of entrepreneurship. It is aimed at introducing the innovation imperative for SMMEs and innovation as a tool for competitiveness for SMMEs. • **SmartXchange** - SmartXchange is an incubator whose core mandate is to provide enterprise development services to SMME's in the Media, Information Communication Technology and electronics sector. SmartXchange manages a programme that identifies and assists in developing quality skilled MICTe SMME's in KZN and also to build a pool of skilled MICTe workers that will enable KZN businesses to flourish. SmartXchange partners with corporates from the MICTe industry, tertiary institutions and the government sector to work towards

up skilling entrepreneurs and the youth. Through these partnerships, SmartXchange is able to also contribute towards the creation of sustainable jobs, economic growth and the competitiveness of the province. **There are two incubators located in Durban and recently established in Port Shepstone.**

- **Innovate Durban** - The Innovate Durban Programme was launched in 2014. The purpose of this programme is to highlight the importance of innovation in economic processes as well as channel creativity into improving the City. EThekwini Municipality, the founding member of Innovate Durban, has partnered with various institutions and companies to launch the Innovate Durban brand. The programme has included a number of projects implemented by the city in collaboration with these key partners to support innovation. It is driven by projects focused on creating awareness, building capacity and skills, encouraging community involvement, boosting public and private sector innovation and creating fundamental linkages between all role players and innovation tools to make innovation easy and possible.
- **Smart Cities approach for Durban** – Durban is gearing itself for envisage transition to a 'Smart City' and the use of technology to transform the city i.e. to enhance its livability, workability and sustainability. With a strong ICT backbone/ infrastructure, some of the city's notable progress in this area include implementation of a smart system by the City i.e. the first stormwater management system in Africa. In addition, the Revenue Management Unit has launched Smart Community a smartphone application that will allow customers to interact with our Municipality. Residents who own smart phones or tablets can now download this app from the Google Play and Apple Store. Residents can use this app to report faults using GPS to record the accurate location, view emergency contact numbers and receive their revenue balances and municipal alerts.
- Building on the successes of **mLab Southern Africa**, a mobile solutions laboratory and start-up accelerator designed to help young ICT entrepreneurs, **an allocation of R6 million to expand the initiative** to the Northern Cape, Limpopo and KwaZulu-Natal" (Pandor, 2016).
- **Technology Hubs/ Technohubs have been earmarked for four regions** within KZN, namely: Newcastle, Pietermaritzburg, Port Shepstone and Richards Bay. It is envisaged that the "regional hubs will be used and supported by technology and innovation 'clusters' comprising interconnected companies, specialised suppliers, service providers, and associated institutions in a specific sector or industry" (KZN Techno Hubs, 2016). Each of the hubs are at initial stages of development. **Risks identified include the need for funding for development and operationalisation, firm tenant commitments, EIA delays (at certain sites)**
- **Dube Trade Port -** a business entity of the KwaZulu-Natal Provincial Government, is charged with the responsibility to develop the province's biggest infrastructural project. Considered one of South Africa's top 10 investment opportunities, this designated Special Economic Zone (SEZ) is geared to promote foreign and local investment. Dube Tradeport is located on a 2,840 hectare site and includes an agriculture zone, office and retail area, as well as a cargo terminal. Its technology network, Dube iConnect, provides high-speed broadband connectivity and voice services. In October 2016, DTP signed an MOU with Cipla Biotech for their R1.3billion investment in a new biosimilars manufacturing facility (the first of its kind for South Africa and expected to start in 2018), and is expected create 180 permanent jobs, predominantly in the engineering and biological science fields.
- Sector-specific innovation/ R&D initiatives such (CAPRISA, MRC, SASA, UKZN STIP and others)
- The Department will pilot a **grassroots innovation initiative in 2016/17 with a R2 million investment that will focus on supporting innovators and technology entrepreneurs in the informal sector and in marginalised communities**" (Pandor, 2016). To leverage these opportunities, the DST are creating 'innovation centres' within each municipality that will partner with agencies, universities and the private sector

Key Finding

- Whilst there are a number of key innovation initiatives, there appears to be no one centrally coordinated body for focused innovation development in the province, and no clear provincial system of innovation
- Certain regions/ districts appears to have own innovation development agenda (e.g. Innovate Durban, and proposed KZN Regional Technohubs)
- eThekwini Municipality is becoming a forerunner for innovation and ICT/ smart city development in the province

Considerations for KZN Innovation Strategy

- Provincial Innovation ecosystem to be clarified/ proposed for development
- A central coordinating body to steer innovation efforts in the province
- eThekwini Municipality, via Innovate Durban, to play a central role in the local RIF to continue to champion innovation initiatives in the region.

Feedback from Stakeholder engagements

The key findings from stakeholder engagements (using one-on one interviews, focus group workshops and surveys) are found below. **Approximately 200 key innovation stakeholders were engaged in the process**. Stakeholders were representative of public sector, private sector, academia and civil society, across KZN. Some of the key common findings emerging from the extensive stakeholder engagements held through the province were:

- Innovation is slowly gaining momentum in Kwazulu-Natal (eThekwini Municipality Innovate Durban, Technohubs, and others)
- Broadband infrastructure and proposed rollout plans are critical for creating an enabling environment for innovation
- Various funding instruments are available for innovation/ research development, however there is a greater need for awareness
- There is an ad-hoc approach to innovation development/ initiatives in the province
- There is limited understanding and/ or awareness of innovation. Additionally, people and business need to relate innovation to their daily lives
- There appears to be little buy-in for innovation development by key decision-makers
- Kwazulu-Natal innovation efforts behind those of provincial counterparts, in particular Western Cape
- There is limited access to information/ knowledge in the province – limited marketing of innovation support and enterprise development support in the province
- Adequate collaboration, in particular public-private partnerships are required to strengthen innovation development in the province
- SMMEs play a critical role in the innovation value chain, and should receive adequate support to ensure its sustainability
- Government plays a key role in prioritizing innovation in the Kwazulu-Natal and hence it support to innovation is to be strengthened
- Innovation development efforts needs to be priority sector driven (by regions/areas)
- Innovation development should be needs based to make it more relevant (and easily adopted)
- Formalised incentives are required (and awareness of these) to stimulate innovation/ research development and targeted to business
- Entrepreneurial skills development is a key ingredient for successful commercialisation/ business sustainability

- There appears to be a skills mismatch between industry needs and academic outputs
- Red tape and bureaucracy a hindrance to innovation and enterprise development
- Entrepreneurial skills needs to be introduced at school level
- Lack of skills (“brain drain’’) in certain areas and shortage of skills
- Civil society must take up role of stimulating innovation and changing attitudes
- Key priority / potential sectors identified (farming, tourism, manufacturing, ICT, mining beneficiation, maritime) for innovation development
- Need for political will for innovation to succeed and grow
- Funding support (both traditional and non-traditional) for innovation development/ enterprise development and support critical

Innovation Audit SWOT Analysis

The tables below (Tables 13-16) reflects individual strengths, weaknesses, opportunities and threats tables, respectively, of the consolidated KZN Innovation Baseline Audit findings.

TABLE 13: KZN INNOVATION STRENGTHS

Strengths	
• Key policies, strategies include innovation development as a strategic area of focus nationally, and in the province (NDP, KZN PGDS, KZN Investment Strategy, IPAP) • There are many key innovation role-players across the innovation value-chain nationally and provincially, that play a significant role in innovation development nationally and provincially • There are pockets of excellence within the finance and business, manufacturing, transport and communications, and government services sectors in various forms (ICT, IP, R&D, etc.) and as such, the Province can leverage off these leading sectors (as well as other prominent sectors such as construction and agriculture and forestry) in order to drive the growth in innovation	• More people are starting to become aware of innovation • Innovation initiatives starting to gain momentum in the province, e.g. *Innovate Durban* & ''*Smart Durban*" concept/planning, Technohubs, etc) • Some of our academic institutions are responsible for significant research output (e.g. UKZN) • Broadband infrastructure development (including planned rolled out) is a priority for the country. • Strong knowledge and expertise in certain sectors of the province • There are multiple sectors that could provide the catalyst for innovation across the various sectors

TABLE 14: KZN INNOVATION WEAKNESSES

Weaknesses		
• KZNs declining annual economic growth rate • Definition of innovation is broad (varying definitions) with limited understanding and/ or awareness of innovation. • Perception that innovation is about ICT only • KZN is lagging behind other provinces with respect to innovation development • Knowledge/ access to information limited in the province • Limited marketing of key funding instruments for innovation – particularly outer-lying regions • No systematic/ coordinated approach to innovation and no innovation ecosystem present • Innovation not top of mind for key decision-makers (limited buy-in) • No coherent plan for innovation in the province	• No space for creativity at foundation levels • High illiteracy levels • Needs to improve Maths and Science results in the province • SET enrolments in HEI can be improved (particularly Unizulu) • R&D expenditure as a % of GDP can be improved • Innovation is held back by authorities who are less receptive to new ideas/possibilities • Policy reforms which are not people focused • Limited capital/ funding (including SMME development funding) • Low levels of awareness of innovation funding • Unequal education facilities and opportunities • Over-regulation and slow-moving processes hamper innovation • Limited creative attitudes/ mind-sets • Limited relevant research and development • Lack of knowledge and resistance to change • There is a need for social innovation focus to grow the economy	• Lack of entrepreneurship training • Limited technical institutions (especially in outer-lying regions) • Limited incentives and funding for innovation development • Lack of flexibility by Government • Productivity is low • Labour legislation/ laws are restrictive • Skills mismatch with industry needs • Inefficient/ limited communication systems • Lack of relevant skills to support innovation across the economy • Lack of strategic partnerships • Lack of/ limited resources and infrastructure – especially rural areas • Limited basic Infrastructure (road, water, energy) • No integrated collection of innovation data (patents, trademarks) for the province

TABLE 15: KZN INNOVATION OPPORTUNITIES

Opportunities		
• A needs-based approach to innovation • Richards Bay IDZ and port development, Dube Tradeport (within designated SEZ), and Aerotropolis development, and other key catalytic projects • KZN Technohubs (Port Shepstone, Pietermaritzburg, Richards Bay and Newcastle) • Drought/ climate change can be an opportunity for innovation • Township/rural infrastructure development • Development of township economy • Reduce poverty and unemployment • DST funding allocation to KZN for mLab and a pilot project to support innovators/ techpreneurs in marginalized communities • Various funding instruments are available for innovation/ research development • Innovation could allow for improved market opportunities • Innovation could allow for increase in	• Need to change attitudes and create awareness • Need to consider the unskilled youth in the strategy • Need for pooling of resources • Build an ecosystem around our existing infrastructure that is sustainable • Technology transfer/ learning from other countries • Synergy between academia, industry and government to further strengthen innovation and economic development • Civil society must take up role of stimulating innovation and changing attitudes • Funding support (both traditional and non-traditional) for innovation development/ enterprise development and support critical • SMMEs play a critical role in the innovation value chain, and should receive adequate support to ensure its sustainability • Formalised incentives (and awareness of these) to stimulate innovation/ research development and targeted to business are not being fully utilised	• An opportunity/ need to evangelize entrepreneurship • Need to introduce entrepreneurship skills at school level • Inculcate culture of innovation at a young age • Bottom-up approach to innovation • Innovation development efforts needs to be priority sector driven (by regions/ areas) • Key priority / potential sectors identified (farming, tourism, manufacturing, ICT, mining beneficiation, maritime) for innovation development • Innovation development should be needs based to make it more relevant (and easily adopted) (e.g. in response to drought- water from the sea(desalination and generation)) • Target "low hanging fruit'' sectors for innovation development –e.g. agriculture • Drive innovation through procurement processes • Improving ICT infrastructure

arrivals/investors and hence, economic spend and jobs • Use innovation to revitalize older industries • Opportunity to link with communities and use social/ inclusive innovation to improve quality of life • RIFs proposed as instrumental in promoting innovation at a regional level	• Entrepreneurial skills development is a key ingredient for successful commercialisation/ business sustainability • Adequate collaboration, in particular public-private partnerships are required to strengthen innovation development in the province • Opportunities in key sector localization efforts to strengthen innovation	• Opportunity to use social media as well as smartphones • Innovation could help to improve service delivery/ simplify • There is a need to increase the focus on breakthrough innovation, not just incremental innovation

TABLE 16: KZN INNOVATION THREATS

Threats
• Limited coordinated innovation statistics and information for the province • The largest barriers to SA's future competitiveness are health and the quality of education, specifically the rate of higher education enrolments • Low pass rates in maths and science subjects • Political instability/ lack of investor confidence • Tough economic trading climate both globally and nationally • The risk of economic rating downgrading • Disruptions at academic institutions • Drought/ climate change • Marginalisation of rural economies • Government regulations (red tape) and bureaucracy (long turnaround times) hindering innovation • Limited buy-in from leadership especially private sector • Lack of complementary finding for innovation across its wide value chain • Stiff competition from other innovation economies within South Africa and other regions

Part C – KZN's Ten Year Innovation Strategy

The basis for the Innovation Strategy for KZN is to enhance the growth of targeted key and priority sectors in KZN, improve job creation efforts and ultimately improve the economic growth of the province. Hence, the Innovation strategy is largely aligned to the *2016 Revised Provincial Growth and Development Strategy* of KZN and has been developed to respond to the following key imperatives:

- *Inculcate innovation amongst people*
- *Bridge the gap in economic development through innovation*
- *Create and apply knowledge that is relevant*
- *Empower people to innovate*
- *Encourage/ unleash innovation in business*
- *Apply innovation to address global and social challenges*
- *Invest in knowledge-supporting infrastructure and*
- *Unleash innovation within the economy of KZN*

This innovation strategy is supportive of the existing key economic plans of the province (priority sector focus by district), to enhance the economic growth of the province.

The key themes emanating from the findings of the KZN innovation audit are as follows:

- The need for extensive **awareness and understanding** of the importance of innovation
- Encouraging **stakeholder collaboration that is inclusive** (i.e**. quadruple-helix innovation** approach **and knowledge-sharing** by nature. This will seek to create a seamless innovation ecosystem and innovation value chain.
- Innovation development efforts should be focused in its approach and **prioritized by key sectors and/ or KZN catalytic projects, per district**. This will assist to expedite sector growth initiatives (as outlined in PGDP) and ultimately economic growth of the province. (refer to Table 17 for a list of proposed key sectors – existing and emerging (based on literature review of district comparative advantages and stakeholder engagements), tabulated by district
- The need for a clear system of innovation for the province, and the need for a centrally coordinated innovation platform
- A **needs-based approach** to innovation that encourages all citizens of the province to be proactive and identify creative and/ or innovative ways to solve problems that will improve quality of life

- **Human capital development needs to be prioritised** across all stakeholder types (government, academia, private sector and civil society). Foundation level development, specifically pertaining to creative thinking, school maths and science is also key, as well as improving the number of SET qualifications, the development of key technical skills (in proposed priority sectors – such as green economy (alternative energies), environmentalists, chemical manufacturing, farming skills, etc., specialised skills transfer, and the development of entrepreneurial and business skills
- The need for an **enabling environment to support innovation development** in the province that includes the enabling institutional arrangements, infrastructure and resourcing (both financial and non-financial) support.
- Social and inclusive innovation imperatives that increases the involvement and impact of civil society (as a result of innovation)
- The need for increased entrepreneurship support (focusing on innovation)

Based on the above key themes emanating from the innovation audit, the following Vision and key strategic pillars/focus areas (refer Figure 12 below) have been formulated that form the foundation for the KZN Innovation Strategy, and its storyline.

Vision

Building an inclusive innovation ecosystem to strengthen KZN's economic growth and improve quality of life

Strategic Objectives

The key strategic objectives of this 10-year strategy are four-fold and proposed as follows (and diagrammatically illustrated in Figure 12 below):

1. Priority Sector focus to bolster economic growth

2. Human capital development to support the growth of KZN's knowledge economy

3. Social and inclusive innovation for improving quality of life of KZN citizens

4. Innovative entrepreneurship and enterprise development to enhance KZN's economic competitiveness

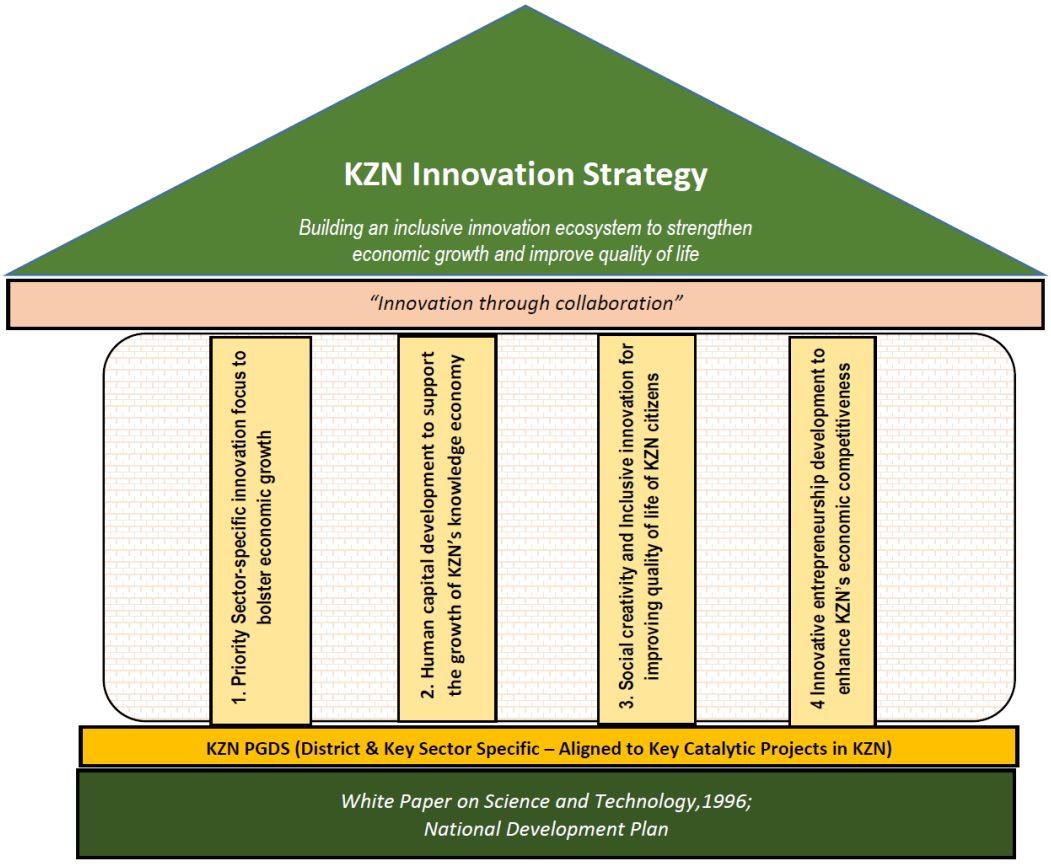


FIGURE 12: KZN INNOVATION STRATEGY MODEL

Key Strategic Objectives Unpacked

1. Priority Sector innovation focus to bolster economic growth

- KZN has ten district and one metro, with varying and individual sectoral differences and advantages and attributes. The economic plans of the province are currently geared towards sectoral development. Hence, it makes sense to build the province's innovation plans to support sector development. In this regard, RIFs are **proposed to support key and existing and emerging district sectors** (as per Table 17) in the following manner:
    - Providing sector (and industrial cluster) representation on the RIF, including key industry/ business specialists
    - Provide a feedback mechanism to the industry-specific bodies/ association
    - RIFs to champion/ lead sector –specific innovation plans
- The following table (Table 17 below) **proposes the key existing (bold) and emerging (green) sectors/ sub-sectors in the districts of KZN for innovation focus. The envisaged RIFs will not necessarily focus innovation efforts for all these sectors, but may choose these for prioritisation**. This proposed model drives inclusivity and yet allows for innovation to be

relevant at a local level .It provides an enabling platform that is voluntary, that allows to strengthen existing economic plans. Existing sectors are bold, emerging sectors (in green). Refer to Section on Deliver Mechanism

TABLE 17: PROPOSED TARGETED SECTORS FOR INNOVATION DEVELOPMENT, BY DISTRICT/ METRO

	Key Priority Existing and Emerging Sectors (based on review of PGDP, District Comparative Advantages Report (2012) and key stakeholder feedback_	Proposed Targeted Sectors (Key Existing and Emerging) for Innovation Development
eThekwini Municipality	• **Chemical manufacturing** • **Transport, trade and logistics** • Automotive Manufacturing • Finance and Insurance • Tourism (events) • Agro-processing • Green Economy (manufacturing) • Air Transport • Ocean Economy	• **Chemical manufacturing** • **Transport, trade and logistics** • Automotive Manufacturing • Agro-processing • Finance and Insurance • Green Economy (manufacturing) • Air Transport • Ocean Economy
iLembe District Municipality	• **Agriculture (sugar cane)** • Agro-processing • Wood processing, • Beach resort tourism • Property development and real estate • Green Economy	• **Agriculture (sugar cane)** • Agro-processing • Green Economy
Amajuba District Municipality	• **Metals manufacturing** and metals beneficiation • **Coal mining** • **Textile and clothing** • Chemical manufacturing • Wholesale, retail and trade • Agriculture and agro-processing	• **Metals manufacturing** and metals beneficiation • Chemical manufacturing • Agriculture and agro-processing
Ugu District Municipality	• **Forestry and timber production** • Agriculture • **Tourism and hospitality** • **Food beverages and tobacco processing** • Post and telecommunications • Wood processing	• Post and telecommunications
Umgungundlovu District Municipality	• **Forestry and timber production** • Agriculture and hunting • Public administration • Post and telecommunications • Agro-processing	• **Forestry and timber production** • Post and telecommunications • Agro-processing
Uthukela District Municipality	• **Land and Water Transport** • **Food and beverage processing (Pork products and chocolate drinks)** • **Agriculture and Hunting** • Clothing and textiles • Renewable energies	• **Land and Water Transport** • **Agriculture** • Renewable energies
Umzinyathi District Municipality	• Agriculture and hunting • Forestry and Logging • Tourism (Battlefields) • Food and beverages (livestock processing) • Mining beneficiation (coal and anthracite)	• Agriculture • Food and beverages (livestock processing) • Mining beneficiation (coal and anthracite)
Umkhanyakude District Municipality	• Tourism (Ecotourism) • Agriculture and hunting • Wholesale and retail trade • Green economy (alternative energy)	• Ecotourism • Agriculture • Green economy (alternative energy)

Harry Gwala District Municipality	• Agriculture and hunting • Retail trade and services to Eastern Cape • Agro-processing (dairy) • Tourism	• Agriculture • Agro-processing (dairy)
King Cetshwayo District Municipality	• **Forestry and logging** • **Wood processing** • **Metal and machinery manufacture** • **Land and water transport** • Construction and engineering • Agriculture and agri-processing	• **Metal and machinery manufacture** • **Land and water transport** • Construction and engineering • Agriculture and agri-processing
Zululand District Municipality	• Agriculture and hunting • **Forestry and Logging** • Meat and skin processing • Mining beneficiation (coal and anthracite) • Cultural tourism	• Agriculture • Mining beneficiation (coal and anthracite)

- In addition to the sectors listed above, consideration should be given to development of innovation within the following key sectors:
  - Waste beneficiation
  - ICT
  - Healthcare
  - Traditional medicines

  There is a need for focused and needs based approach to innovation development, within the key sectors listed above. This includes encouraging youth, business and civil society to come up with solutions to challenges affecting the province of KZN, and South Africa (water restrictions and drought, energy shortage, high mortality due to ill health (HIV/ AID, TB, etc), transportation (traffic congestions), . Hence, innovations that are breakthrough, disruptive and game-changing in nature, are to be encouraged, over and above just incremental innovations.

2. Human capital development to support the growth of KZN's knowledge economy

Scarce relevant skills (key technical and entrepreneurial skills) and the need to prioritise of skills development featured prominently as a finding in the KZN Innovation Baseline Audit. The consistently poor maths and science results of the province continues to hamper the SET enrolment profile of the province. These, invariably impact the level and quality of R&D outputs, the number of suitably qualified and relevant scientists, engineers and technologists, to grow key sectors of our province. A further challenge being that the skills produced are adequately aligned to industry needs. It is therefore proposed that:

- The planning of education and human capital development (i.e. R&D activities, relevant experience and creativity) efforts in the province be cognisant of the **proposed district sectors** as presented in Table 17 above (skills alignment) The prioritisation of relevant skills development and focused research outputs, together with coordinated stakeholder efforts

and resources to develop targeted skills in the areas of Maths, Science, Engineering and Technology. It is envisaged that the MKI (Moses Kotane Institute) mandated to facilitate education, training and development opportunities for learners, youth, adults and historically disadvantaged groups and individuals in Science, Technology, Engineering and Mathematics (STEM) and other related fields, will play a key role in focusing and advancing the innovation skills priorities of the province. **It is proposed that, as MKI plays a key role in advancing innovation skills development in critical areas of STEM, additional support be channelled to organization. However, what is required is the strengthening of partnerships, between skills development institutes (such as MKI) and private sector.**

- In addition to the above, HEIs and other key academic and industry training institutions, need to be more responsive and relevant and easily accessible to society to help catalyse innovation
- Entrepreneurship is synonymous with innovation and creativity. Hence, the concept of innovative entrepreneurship and creativity concepts need to be instilled not only in business, but amongst the youth, especially at an early Hence, **such concepts are proposed to be introduced in the academic curricular (at foundation, secondary and tertiary levels of education)**
- ICT and its application thereof, remains a key enabler for human capital development. There are a number of ICT and technopreneur skills development/ incubator initiatives that are to support this ICT industry in the province, such as SmartXchange, The Durban Innovation Hub, and other. **The proposed KZN Innovation Information portal is envisaged to be an instrumental platform in providing access to information and knowledge transfer to stakeholders for development across the innovation value chain, and growing the knowledge base of the province** (aligned to the KZN PGDS strategic goal). In addition, the development of open sources of information (accessible and free – such as Open Data Durban) are proposed to help develop the human capital base of the province.
- There are currently several mentorship, training and incubator programs to support human capital development within the innovation value chain. Some of the pertinent ones include SEDA Invotech Incubator located at DUT (to support the creative and digital industries and more recently green industries focus), SmartXchange (ICT entrepreneur development), TIA Technology Transfer Stations, TIA Innovation Skills Development and others. **It is proposed that existing human capital platforms (such as mentorship programs/ incubators) provide support to targeted sectors (as proposed here), and a concerted effort to create awareness of these platforms.**

- KZN Technohubs, currently being developed in Port Shepstone, Richards Bay, Amajuba, and Pietermaritzburg, are envisaged to **play a role as a regional ''innovation cluster'' for knowledge convergence and sharing of knowledge**. The Innovate Durban forum, an initiative of eThekwini Municipality, has gained much momentum as a key innovation knowledge sharing platform and is envisaged to continue to do so.
- In addition, the **RIF compilation of forum members are envisaged to comprise individuals with key industry and entrepreneurial skills to build the knowledge base of the RIF** and transfer skills back to their respective organizations and communities.

3. Social and Inclusive innovation that improves the quality of life of KZN citizens

Economists estimate that between 50 and 80 percent of economic growth comes from innovation and new knowledge. Globally there has been a surge in the focus on social innovation and there have been positive impact on society. India's innovation policy for inclusive growth (India STI Policy, 2013), places emphasis on accessibility, availability and affordability of solutions for the people. Social innovation is helping to solve some of the world's most pressing problems with new solutions such as fair trade, distance learning, mobile money transfer, restorative justice, and zero-carbon housing. In East Africa, for instance, the development of M-PESA (a mobile money payment system born out of social innovation) has become an avenue for 9 million people to gain access to secured financial exchange services. This African success story has completely revolutionized the regional business terrain, at the same time empowering local people by providing an easy-to-use and readily available banking service that was impossible to access because of a poor banking infrastructure and a strict regulatory framework.

Closer to home, and perhaps one of the most innovative and ambitious project has been the establishment of a credit mechanism controlled by the homeless themselves. This is called uTshani Fund (grassroots fund), an initiatives spearheaded by the SA Alliance of community organizations and support NGOs, affiliated to SDI (Shack Dwellers International). uTshani Fund has been a national and international pioneer in the field of tenure security, incremental housing development, housing finance innovation and creative utilisation of policy and subsidy instruments by building pragmatic partnerships with government. uTshani Fund's operating principles are that finance should be made available directly to Housing Savings Schemes on a collective basis, and that the groundwork of the Fund should be undertaken at community level. Accordingly, uTshani Fund develops systems which dovetail with the emergence of practice rooted in daily savings and collective saving schemes.

Based on the KZN baseline innovation audit, social/ inclusive innovation efforts in the province are limited (and poorly documented/ profiled). Some possible reasons could be attributed to limited (infrastructure and resourcing) support for developing social innovation in the province. Hence, the following key areas of focus are recommended to develop the social and inclusive innovation imperatives of the province:

- **Improving awareness and understanding** of the importance of innovation and how innovation/ creativity can improve/change the quality of life:
    - The need to instil a culture of creativeness and innovation in all citizens of KZN, particularly in our youth, is necessary to develop a future generation of critical thinkers, problem-solvers, entrepreneurs and employable people. Hence, efforts to raise the awareness and understanding of the importance of innovation need to be intensified, across KZN province. This is intended to elevate the need and importance of social innovation. **In support, it is proposed that a simple "Innovation Charter" for KZN province is developed to provide a common vision and reminder of the importance of the need to innovate, as well as to encourage individuals to be innovative and creative problem-solvers. This would be the main innovation reference for KZN.**
    - However, this can only be achievable once a/the **definition/s of innovation** and importance of innovation (i.e. business/ **organizational innovation, social innovation, inclusive innovation, creativity**) applicable to KZN are agreed to by the key innovation stakeholders/ custodians of innovation in the province).
    - It is further proposed that **innovation champions/ ambassadors** be identified (per district of the province and KZN) to inspire and motivate individuals to innovate, together with profiling of local innovation success stories
    - Effective and inclusive innovation can only be attained if all key stakeholders (i.e. civil society, government, private sector and academia) have a **clear understanding of their roles and responsibilities in developing/ supporting innovation** across the **innovation value chain** (refer Annex A), and collaborate accordingly:
- **Creating a platform that encourages, develops and adopts social innovation and social entrepreneurship initiatives** – in addition to public sector, government and academia representation, the **proposed RIFs** should include representation from civil society, including community-based organizations, NPOs, tribal authorities, religious bodies and other key civil society representatives.

In addition, the proposed **KZN Innovation Council**, is envisaged to coordinate a **central innovation information portal** for the province (similar to the *Open innovation platform used by Open IX by the Pretoria Innovation Hub),* that amongst other objectives, will encourage and crowdsource creative ideas and innovative solutions to the province's challenges. Corporates, NGOs, humanitarians, and other key organizations/other investors can identify social initiatives to invest in/ adopt, via this virtual platform.

Finance, including public and philanthropic investment in high risk R&D, targeted at the areas of greatest need and greatest potential for improving the quality of life of our citizens, and organised to support the key stages of innovation, remains a key catalyst for success. Incentives (such as the SAB Foundation's Social Innovation Funding Support and Awards Programme 2016). **It is therefore proposed that a dedicated Innovation Fund (as part of a PPP initiative) for civil society, focusing on social and creative innovation be set up to encourage, stimulate and grow social innovation as a means for bottom up approach to improving the quality of life.**

- The need for an inclusive innovation agenda that prioritizes women and youth-driven innovation initiatives in the province.

This social/ inclusive innovation focus proposed for KZN is envisaged to allow for the following:

- inclusivity of civil society into the innovation value chain
- Shift in the innovation thinking paradigm ("*anyone can innovate*")
- Reduce the barriers to economic participation in SA
- An alternative economic model to the traditional and existing one
- Assist to strengthen sustainable economic growth and the creations of jobs
- Availability, accessibility and affordability of solutions (via innovative methods) that improve quality of life, especially for marginalized communities

4. Innovative entrepreneurship & enterprise development to enhance KZN's economic competitiveness

Entrepreneurship and enterprise development in the cornerstone to the development of KZN's and SA's economy. Innovation and entrepreneurship are often synonymous with each other, with many studies citing the importance of innovation in business growth and sustainability. Moreover, innovation has been noted as a key driver of an organization's competitiveness.

- Innovation **support** across the innovation value chain (refer Annexure A for innovation value chain) needs to be supported. Two key issues that emerged during the KZN Baseline

Innovation Audit: i) **R&D funding for start-up and small business needed to be strengthened and made easily accessible** and ii) whilst innovation support mechanisms do exist for business, business owners still **struggle to find consolidated support information**.

- Hence, an **innovation support toolkit** for business is proposed to fill the information gap for enterprise owners/ potential entrepreneurs.
- RIFs to encouraging the use of **open innovation platforms** (a trend in innovation development) as a source of valuable information (new ideas, ways to become more efficient/ effective, combination of external and internal R&D and ideas).
- In addition, the strategy proposes the province set up a dedicated **KZN Small and Emerging Enterprise Innovation Fund** that will strengthen the subsidy for R&D expenditure for the target market in question. In addition, this Fund should be designed in such a way that it facilitates quick access to the funding by innovators. The Fund should further prioritise enterprise innovation within key sectors (as proposed in Table 17 above).
- Other key enablers to support enterprise innovation development include the following:
  - Strengthened support for skilled human capital (both technical and entrepreneurial skills). This will include accessing key existing mentorship and training and incubation support programs such as SmartXchange, Invotech, and others (Refer to section above on Human Capital Development)
  - Provision of information on incentives to motive entrepreneurs to innovate, such as the R&D Tax incentive
  - Simplification of the regulatory frameworks to promote and enhance entrepreneurial activity and innovation practices.
  - Stimulating and inspiring innovative entrepreneurship –Business Innovation Awards Day and profiling successful innovation

The call to action for innovative entrepreneurship and enterprise development that this strategy proposes is intended to:

- Strengthen and improve existing economic plans and efforts of the province
- Present an opportunity to strengthen our export capability of KZN
- Improving the competitiveness of KZN enterprises through innovation

Other Key Enablers for innovation development in KZN

ICT Infrastructure

A significant milestone for ICT development in South Africa has been Cabinet's approval (in September 2016) of the *National Integrated Information and Communication Technologies ICT) Policy White Paper*. The White Paper is envisaged to underpin a "*dynamic and connected vibrant information society and a knowledge economy that is more inclusive, equitable and prosperous*" as envisaged in the *National Development Plan (NDP)*. It sets out the framework of how government wants to provide access to modern communications infrastructure and services to facilitate the entry of new players and meaningful participation of all citizens, including those in rural areas. Latest KZN broadband statistics (Source: KZN EDTEA) have shown that close to 30,000km of fibre optic cable have been rolled out in the province to date. The largest rollout is in eThekwini Municipality (9509km), followed by Umgungundlovu District Municipality (2590km) and Uthungulu District Municipality (2402km). Amajuba District Municipality and Umkhanyakude District Municipality, have the lowest fibre-optic roll out at 932km and 766km respectively.

The KZN Innovation Strategy (2016-2026) will align to the directive set by the *National ICT White Paper (2016*) to develop innovation and ICT in the province. **There is a need to prioritize broadband roll out** such that ICT/ innovation can be used to address key challenges as identified by the NDP that includes (but not limited to):

- reducing unemployment,
- improving quality of and access to education for the poor,
- provision of adequate and accessible ICT infrastructure and
- bridging the spatial and digital divides for inclusive development, respectively.

Access to information, has been identified as key to the effect development of innovation in the province (the PGDS further states the role of ICT to grow KZN's knowledge base). **The proposed KZN Innovation Information portal in this strategy is a key ICT platform proposed to bridging the innovation information gap, including to raise awareness of. However, without the necessary ICT broadband infrastructure in place, human capital development efforts in many areas (particularly rural-based) in the province will be slow progressing, as well as will not be able to access the proposed Innovation Information portal. It is therefore critical that EDTEA, together with key ICT development partners (Telkom, Broadband Infraco, Vodacom, Neotel, Dark Fibre Africa, and others**

prioritize and expedite the roll out of broadband, with particular focus on the rural/ resource-stricken areas of the province.

It is further recommended that the KZN Innovation Information Portal be funded as part of a PPP.

In addition, free WiFi is currently being rolled and is planned to be made available in various public hotspots, targeting rural areas, townships and areas near academic facilities (where there are high concentration of students), across Kwazulu-Natal. This will be a key mechanism of access to innovation information particularly those in outer-lying and rural areas.

Physical Infrastructure

The provision of a knowledge base i.e. adequate and appropriate skills and human capital (ideas, knowledge experience) to support KZN's key sectoral growth, key catalytic projects, industry-aligned R&D activities, and transformation of rural economies is dependent on accessible physical infrastructure to support innovation and ICT development. There are currently existing and planned physical infrastructure to support the province's innovation, ICT and R&D requirements:

- **Dube Trade Port Corporation (DTP)** - Currently an investment attractive destination, DTP is envisaged to be a key innovation front-runner in the province that will participate in and add value to the proposed eastern RIF (eThekwini/ iLembe).
- **KZN Technohubs** - The *KwaZulu-Natal Provincial Treasury* has identified this need for technological innovation and collaboration and has begun developing technohubs (development currently underway) in four key regions (Richards Bay, Port Shepstone, Pietermaritzburg and Newcastle) across the province to promote the knowledge economy, drive socio-economic development and increase competitiveness. To date, R120million has been secured to develop the technohubs, with R5.4 billion required to get the four hubs fully operational within the next 15 years. Private sector investment has been identified as critical to operationalize the technohubs. **The structure provided by the KZN Technohubs are expected to create ''innovation clusters" with key sector representation, that will strengthen regional innovation efforts, and are further envisaged to be coordinated by the proposed RIFs**
- **Innovate Durban Precinct** - One of the key projects within the Innovate Durban programme is the establishment of an Innovation Hub or Precinct. Currently, a pre-feasibility study is underway, which will determine whether or not such a facility is a viable option for eThekwini. The envisaged Innovation Precinct/Hub will be a 'one-stop shop' that will cater for the full

spectrum of innovation needs of individuals, businesses and academics, from concept to commercialisation. The City is developing itself as a Smart City and an Innovation Hub/Precinct is critical in achieving this.

- Other key innovation infrastructure envisaged to continue to grow the human capital in the province, and provide representation on the proposed RIFs, where relevant are:
    - SEDA Invotech
    - DUT/ CSIR TLIU
    - TIA Technology Stations
    - ***SmartXchange*** (incubators for ICT start-ups)
    - Academic institutions (UKZN, Unizulu, DUT, MUT, various TVET Colleges)
    - Research institutions (MRC, CAPRISA, Cedara College of Agriculture, CSIR and other)
    - Other economic priority zones

Funding

Common to all stakeholders (private sector, government, academia and civil society) engaged during Innovation Audit, was the need to prioritize and access funding for innovation/ ICT/ R&D activities in the province. Historically, the importance of innovation to enhance economic goals of the province was not recognized. Now as the world is evolving to one that is highly information-based, agile and competitive, the need to inculcate innovation as part of our provincial economic strategies/ planning is only just becoming evident. Hence, funding priorities for innovation development have to date been prudent/ limited. However, the success of interventions proposed by this Innovation Strategy is highly dependent on funding support across the innovation value chain. Therefore, the following key recommendations are made with respect to funding:

- It is proposed that a **funding strategy be put in place to support the KZN Innovation Strategy** It is also a key requirement that the leadership and key governmental innovation funding institutions (such as TIA, DTI SPII, Digital Development Fund, and others) buy in to/ prioritise funding support as identified by this KZN Innovation Strategy.
- It is also noted that governmental funding alone would not adequately support innovation development in the province. It is therefore pivotal that **private sector funding** be identified (as part of the detailed funding strategy) and harnessed to support innovation development in the province
- The following key fund types are proposed:
    - ***KZN Small and Emerging Enterprise Innovation Fund***
    - ***Innovation Fund for Social Innovation***

Stakeholder acceptance and buy-in

Buy-in and stakeholder acceptance of the KZN Innovation Strategy, including the proposed delivery mechanism from key decision-makers and custodians of the strategy is critical. Stakeholder collaboration and PPPs are critical for the implementation of the KZN Innovation Strategy

Regulatory Considerations

Whilst science, technology and innovation development in the province (and nationally) is well-regulated in South Africa, consideration needs to be given to simplify/ demystify those Acts and policies regulating certain sectors, such as those within the health and biotechnology sectors, that may be too stringent or complicated, which could hamper new/ innovative product development in the country.

Targets for KZN Innovation Strategy

M&E of the KZN Innovation Strategy is important and needs to be done periodically against pre-determined targets of key innovation measures. It is proposed that a few key targets be developed (in collaboration with key stakeholders) and adopted. It is envisaged that the key targets should include amongst others:

- Targets to be set by each of the key strategic objectives of the KZN Innovation Strategy
- R&D spend as a % of GDP spend in the province
- Patent filing applications
- Other

Additionally it is viewed that the proposed Innovation Index be used to track the status of innovation in the province. The above proposed measurement targets should be unpacked and crystallized in the detailed implementation plan for the KZN Innovation Strategy.

Proposed Delivery Mechanism

The proposed delivery mechanism (Figure 13 below) for the KZN Innovation Strategy, is as follows:

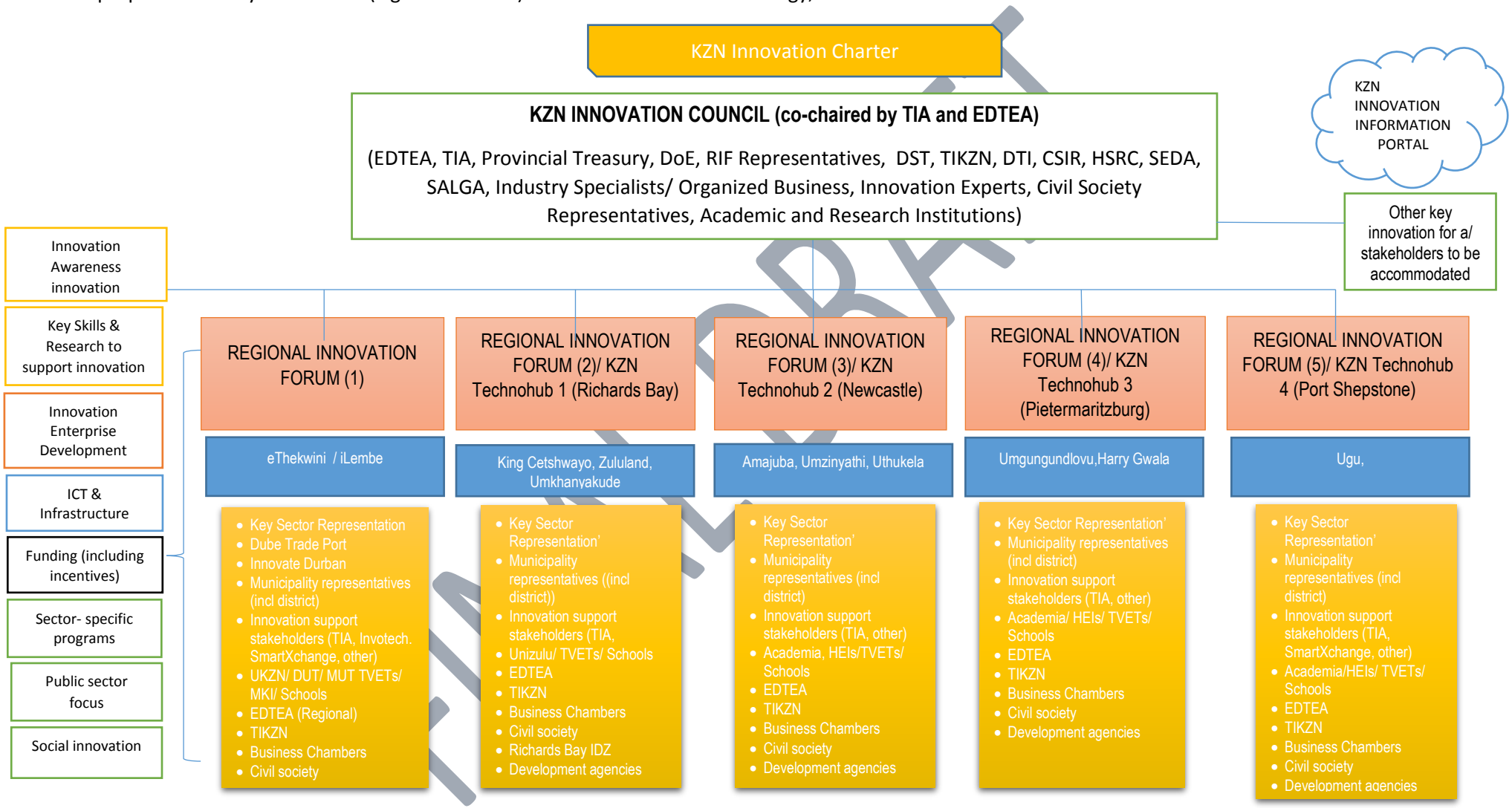


FIGURE 13: PROPOSED DELIVERY MECHANISM FOR THE KZN INNOVATION STRATEGY

Unpacking the proposed delivery mechanism

The proposed mechanism of delivery is built around the following key elements:

- Encouraging a needs-based approach to innovation development in the province
- Inclusivity (creation of an inclusive innovation stakeholder platform (quadruple-helix innovation approach) comprising government, business, academia and civil society.
- Coordinated approach to innovation development
- Reducing red tape and bureaucracy by creating an agile model
- the diversity of the KZN landscape, i.e. with respect to the key sectoral and spatial distinctions of each of the 10 districts and one metro of the province, the proposed delivery mechanism will encompass a model that **hybrid in nature** i.e. that considers both the **geographic/ regional** as well as the **sectoral profiles** per district.

Based on the above, we envisage the **KZN Innovation Charter** to provide the mandate of the Council. It is intended to:

- Create awareness of innovation (simplifies innovation)
- Stimulate cohesiveness and commitment amongst the innovation roleplayers in the province
- It will embrace and encourage different types of innovation (eg. product, process, organizational, social, etc) amongst the various stakeholders

The mandate of the Innovation Charter will be championed via the proposed **Innovation Council** for the Province. It is proposed that this Council be co-chaired by TIA and EDTEA for the following reasons:

- Both organizations have a key focus/ mandate on innovation development in the province
- There is an existing institutional framework to support this Council as key programs of each organization
- It will reduce the time, efforts and resources required to set up an separate legal entity
- It will also allow for leveraging off of existing and future funding/ resources of both organizations
- It allows the province to align innovation to the innovation and economic priorities of the country

The proposed KZN Innovation Council is envisaged to be a key program of both TIA and EDTEA. These 2 organizations will co-chair and manage this particular forum. It is envisaged that the following stakeholders will comprise the Council:

- EDTEA, TIA, Provincial Treasury, DoE, RIF Representatives, DST, TIKZN, DTI, CSIR, HSRC, SEDA, SALGA, Industry Specialists/ Organized Business, Innovation Experts, Civil Society Representatives, Academic and Research Institutions

The Council's operations will be guided by a terms of reference that are adopted by the council members. It is envisaged that this Council will meet quarterly to;

- Update progress on the RIFs
- Advocacy and lobbying
- Access collective funding for the province
- Share innovation knowledge
- Provide operational oversight and support for each of the proposed RIFS

It is envisaged that this Council (in time) will have its own dedicated Secretariat (including key program staff). Additionally, it will have a management committee to oversee administrative and operational functions.

There are ***five proposed RIFs*** that are envisaged to cover the northern, central, eastern, southern and north-western regions, with an envisaged mandate to prioritize priority sector innovation (as per Table 17) per region. It is envisaged that the RIFS will have key programs that include:

- Innovation awareness
- Key skills and research to support innovation
- Innovation enterprise development
- ICT and infrastructure
- Funding (including incentives)
- Sector specific innovation programs
- Public sector focus
- Social innovation

The set up of these RIFs should:

- Leverage off of existing platforms that are in existence (e.g. technohubs)
- Develop its own terms of reference that is geographically appropriate
- Assist with policy and advocacy related to innovation
- Provide an on the ground forum for innovation stakeholders to work together

The proposed **KZN Information Portal** and the **KZN Technohubs**, are envisaged to be key innovation infrastructures that will allow for innovation awareness, and innovation/ sector knowledge convergence and sharing.

Whilst the RIFs are envisaged to be the key innovation fora envisaged to develop the innovation priorities regionally, there could perhaps be a particular district/ local municipality/ organization that may elect to create their own innovation forum, and still be able to gain access to the KZN Innovation Council (and membership).

Listed below in Table 18 are the proposed institutional and structural arrangements, location and proposed roles and responsibilities

Institutional and Structural Arrangements

The following table highlights the proposed institutional and structural arrangements, including mode of operation, and proposed role to support the implementation of the KZN Innovation Strategy

TABLE 18: PROPOSED INSTITUTIONAL AND STRUCTURAL ARRANGEMENTS TO SUPPORT THE DEVELOPMENT OF THE KZN INNOVATION STRATEGY

Proposed Institutional & Structural Arrangements	Mode of Operation	Proposed Key Role for the KZN Innovation Strategy
KZN Innovation Council Co-Chair – EDTEA & TIA)	Physical (meetings)/ Virtual	• Be the custodian and champion for innovation in the province • Provide resourcing and funding to operationalise the Council • Provide the Secretariat function for the Council • Physically housing the Council (proposed TIA) • Provide an oversight role for the RIFs • Measure and report on innovation in the province • Update the Innovation Strategy periodically • Oversee the operationalisation of the information portal • Implement an effective stakeholder engagement plan & ensure synergies amongst the various innovation stakeholders • Assist in developing collateral for each of the innovation programs • To advocate for key enabling innovation polies for KZN • Facilitation knowledge production, transfer and commercialisation • Obtain political and business buy-in for the Council
KZN Innovation Council	Physical (meetings) / Virtual	• This proposed KZN Innovation Council is envisaged to play an oversight role and coordinate innovation efforts in the province • Key proposed members are listed in Figure 11 (Delivery Mechanism) above • EDTEA is envisaged to be the key champion to facilitate the set up of the KZN Innovation Council • In addition to oversight, the purpose of the Council is to be the key custodian of the KZN Innovation Strategy • The Council is envisaged to advocate and lobby for key strategy enablers (such as funding, and other key enablers)

		• It is envisaged that the Council will coordinate the development and roll out of the proposed innovation information portal i.e. the **KZN Innovation Information Portal** • The KZN Innovation Council is further expected to oversee the development of RIFs, coordinate RIF implementation, as well as tracking progress of innovation development efforts in the province • To be accountable for innovation targets in the province • May serve as membership body
KZN Innovation Information Portal	Virtual	• The proposed KZN Innovation Information Portal is envisaged to intended to be public/ private partnership funded • The intention of the portal is as follows: - Provision of key information, such as the Business Innovation toolkit, innovation funder details - Open innovation platform to encourage idea generation in an inclusive manner and to crowdsource innovative ideas to solve social challenges (such as food security, housing, drought/ water security, electrification, etc) - Hosting of online innovation competitions in the province - Crowdfunding platform (medium-long-term strategic objective)
Regional Innovation Forums (RIFs)	Physical (meetings) - 5 regions, namely eastern, central, northern, southern, and north-western regions on KZN	• Five RIFs, each representing a districts/ districts or metro are proposed for the province of KZN • Roll out of RIFs are envisaged to be in a phased approach, i.e. at least 2 RIFs developed in the short-term, and another 3 in the short-medium-term • RIFs are intended to comprise key stakeholders (innovation, industry, local government, civil society and academia) at a local level, to develop innovation within key sectors, by district (hybrid model of sector/geographic proposed)
KZN Technohubs (x4)	Newcastle, Richards Bay, Port Shepstone, Pietermaritzburg	• Regional infrastructure point for innovation development • champion innovation efforts regionally) • Drive regional innovation development by key sector specific needs, • Manage/ coordinate the RIF

Strategic Intent (Short, Medium and Long-Term) and Strategic Objectives

The strategic pillars of the KZN Innovation Strategy, as well as the key enablers of the strategy, have been unpacked into sub-objectives for implementation in the short term (1-3 years) and medium to long term (3-10 years) for the period 2017-2027 as per Table 19 below):

TABLE 19: STRATEGIC INTENT (SHORT, MEDIUM AND LONG-TERM STRATEGIC OBJECTIVES)

	Short-term (1-3 years) focus areas	**Medium-term – Long Term (3-10 years) focus areas**
1. Creating the enabling environment for innovation development in KZN)	• Set up of the Institutional frameworks to support innovation development in KZN • Effective stakeholder engagement • Prioritise funding for innovation development in the province • Development of an ICT/ Innovation Infrastructure Plan to support the innovation infrastructure requirements of this Innovation Strategy Lobby and advocate for simplification of regulations • Enabling conversion of R&D outputs into societal and commercial application	• Secure further partners to strengthen the implementation of the innovation strategy
2. Priority Sector-specific innovation focus to bolster economic growth	• Review and align regional economic plans to include a strong innovation focus • Encourage key sector stakeholder participation at a regional level • Prioritize innovation development within the highest impact sectors, by region • Regional coordination for innovation development	• Measure the impact of the innovation strategy on the economy • Periodically review and update the innovation strategy, with particular focus on relevance to key sectors

	• Improve public sector efficiency through innovation, to expedite service delivery in the province • Align localisation plans of the economy to innovation • Identify and address, sector specific skills development and training. • Sector specific innovation incentivization schemes.	
3. Human capital development to support the growth of KZN's knowledge economy	• Strengthening, alignment and formalisation of partnerships, between skills development institutes and private sector (with respect to innovation skills requirements) • Prioritise STEM & innovation/ entrepreneurial skills development (from grassroots/ foundational phase) that will advance SET enrolments and the innovation agenda • Prioritizing innovation awareness and skills in entrepreneurship and enterprise development • Strengthening support and resources for skills development in key industries • Leveraging successful innovation programs/ expertise (locally and abroad) to strengthen the skills base of the province. • Investment and promotion of excellence and relevance in local R&D that key sector aligned, and needs-based • Creating an environment for enhanced private sector participation in R&D • Access to information to develop the knowledge base of the economy	• Strengthening the innovation/ entrepreneurship focus in the academic curricular • Improving access to information and knowledge to help strengthen KZN knowledge economy • Review and realign the skills focus to the needs of the economy

4. **Social and Inclusive innovation development for improving quality of life of KZN citizens**	• Evangelise innovation/ creative-thinking amongst all citizens of KZN • Provide support for the development of indigenous knowledge-acquired innovation • Emphasize support to allow for gender parity and youth-driven innovation • Provide the necessary support, resources and infrastructure to catalyse inclusive and social innovation development • Align social innovation initiatives to existing civilian/ community infrastructure (that already exists). • Encouraging a needs-based approach to innovation to improve quality of life	• Strengthen partnerships for social innovation development • Measure impact of social and inclusive innovation
5. Innovative entrepreneurship & enterprise development to enhance KZN's economic competitiveness	• Increased support for innovating entrepreneurs (by nurturing and focusing support on start-ups, in particular tech-based, and community-led innovation initiatives) • Improving enterprise efficiencies to strengthen KZN's economic competitiveness • Developing SME R&D for enhanced business competitiveness • Gaining global competitiveness through collaboration • Investing in youth innovators & entrepreneurs, through education, mentoring and training	• Ongoing review and support for entrepreneur development

Levels of Stakeholder Participation and Focus Required to Deliver the Strategy

The four key strategic pillars of the KZN Innovation Strategy have been stratified by stakeholder type, i.e. academia, civil society, private sector and public sector, respectively, and allocated a level of participation and/or focus (low, medium, high and very high) (refer Table 20 below) that is required to support innovation development and implementation of the KZN Innovation Strategy.

TABLE 20: LEVELS OF PARTICIPATION REQUIRED BY STAKEHOLDERS TO DEVELOP KZN INNOVATION (PER EACH OF THE STRATEGIC OBJECTIVES)

	Private Sector	Public Sector	Academia	Civil Society
1. Priority Sector-specific innovation focus to bolster economic growth	▲▲▲▲	▲▲▲▲	▲▲▲	▲
2. Human capital development to support the growth of KZN's knowledge economy	▲▲▲▲	▲▲▲▲	▲▲▲▲	▲▲▲▲
3. Social creativity and Inclusive innovation for improving quality of life of KZN citizens	▲▲▲	▲▲▲▲	▲▲▲	▲▲▲▲
4. Innovative entrepreneurship development to enhance KZN's economic competitiveness	▲▲▲▲	▲▲▲▲	▲▲▲	▲▲
Key Enablers to Support Innovation Development:				
1. Institutional Arrangements	▲▲	▲▲▲▲	▲▲	▲
2. ICT Infrastructure	▲▲▲▲	▲▲▲▲		
3. Physical Infrastructure	▲▲▲▲	▲▲▲▲	▲▲▲▲	▲
4.Funding Support	▲▲▲▲	▲▲▲▲	▲▲▲▲	▲▲▲▲

Key

Low - ▲
Medium - ▲▲
High - ▲▲▲
Very High - ▲▲▲▲

Based on the levels of participation required by stakeholders to develop KZN's innovation, the key innovation stakeholder (by type i.e. private sector, public, sector, academia and civil society), key drivers to innovate, required roles and envisaged outcomes are outlined in Table 21 below:

Proposed Innovation Stakeholder Roles and Responsibilities

Roles and responsibilities, by stakeholder type, have been unpacked based on the proposed strategic model for the KZN Innovation Strategy (refer Table 21)

TABLE 21: KEY INNOVATION DRIVERS, INNOVATION ROLES AND ENVISAGED OUTCOMES (STRATIFIED BY STAKEHOLDER TYPE)

	Private Sector	Public Sector	Academia	Civil Society
Key Driver/s to Innovate	• Job Creation, • Growth and creation of new economic growth • Efficiency and cost-saving	• Improved service delivery Across All Clusters • Cost-saving	• Relevant Skills, Research and Human Capital Development	• Improved Quality of life
Delivery Mechanisms/ Channels	• Innovation culture • Prioritising capital • Commitment to the Innovation Strategy	• Strategic plans and policies • Funding and Infrastructure • Partnerships and collaboration • National, Provincial, Local (working together)	• Universities/ Technical universities • TVET Colleges • Research institutions • Schools • Other	• Religious organizations • NPOs • Individuals •
Required Innovation Role	• **Adopt the KZN Innovation Charter** • **Champion a culture of innovation** • **Champion stakeholder engagement** • **Develop and implement effective and efficient systems and processes (internal)** • **Support innovative industries** • **Co-fund innovation and infrastructure** • **Strengthen collaborative ties with academia to ensure skills alignment to industry needs**	• **Strengthen the innovation priority** • **Adopt the KZN Innovation Charter** • **Provide the institutional framework for innovation development** • **Drive an innovation culture (within government and externally) and champion** • **Develop effective and efficient systems and processes (internal)** • **Lead innovation stakeholder collaboration efforts** • **Prioritise enterprise development support and funding** • **Provide funding for innovation/ ICT infrastructure**	• **Adopt the KZN Innovation Charter** • **Encourage innovative and entrepreneurial thinking (internal)** • **Strengthen collaborative ties with industry to ensure research/ skills output meets industry needs** • **Provide innovation and research infrastructure** • **Access funding for innovation/ research** • **Strengthen engagement with other innovation stakeholders like civil society/ business to: - improve the relevance and impact of research outputs make available infrastructure (to key stakeholders such as**	• **Adopt the KZN Innovation Charter** • **Build awareness/ understanding of importance of innovation** • **Participate in innovation value chain** • **Source of new ideas, and problem-solving** • **Participate in crowd-funding**

		• **Solicit private sector investment in innovation development** • **Reduction in red tape and the cost of doing business**	**civil society, business) that has the potential to support innovation**	
Envisaged Outcomes	• Job creation • Improved Profit • Improved competitiveness • Reduction in costs • Development of new products and services • Increased employment opportunities • Economic growth	• Inculcating / growing innovation culture (internal and external) • Improved efficiency • Reduced red tape and associated costs • Improved service delivery • Providing access to information for all citizens (growing a knowledge economy)	• Greater emphasis on needs based research • Industry-aligned skills development • Job creation • Creating next generation of innovators & problem-solvers	• Improved Awareness of Innovation (creative awakening) • Employment & Job Creation • Solving problems and improving quality of life

Way Forward

It is proposed that this draft strategy follow the following protocol:

- Finalise the draft strategy
- Share the final draft strategy with key stakeholders to obtain buy-in
- Develop the draft implementation plan and M&E frameworks for the Strategy
- The proposed Co-Chairs of the KZN Innovation Council (EDTEA and TIA) to approve the final strategy (within their respective organizations)

Bibliography

Carayannis, E.G. and Campbell, D.F. G. 2009. *'Mode 3'* and *'Quadruple Helix'*: toward a 21st century fractal innovation ecosystem. International Journal of Technology Management (IJTM), Vol. 46, No. 3/4, 2009

Council for Scientific and Industrial Research (CSIR) (2015) 'Technology for Rural Innovation and Economic Development - Tech4Reid'. Department of Science and Technology. [Date accessed: 15 June 2016]

Council for Scientific and Industrial Research (CSIR) (2015b) '2014/15 Annual Report'. Available at: http://www.csir.co.za/annual_reports/annual_reports_archives.html [Date accessed: 27 June 2016]

Department of Economic Development, Tourism and Environmental Affairs (2016) 'Ezomnotho'. Available at: http://www.kznedtea.gov.za/index.php/ezomnotho [Date accessed: 14 June 2016]

Department of Economic Development, Tourism and Environmental Affairs (2010) 'KZN Investment Strategy'. Available at: http://devplan.kzncogta.gov.za [Date accessed: 13 June 2016]

Department of Mineral Resources (2011) 'A Beneficiation Strategy for the Minerals Industry of South Africa'. Available at: http://www.eisourcebook.org/cms/South%20Africa%20Mineral%20Beneficiation%20Strategy.pdf [Date accessed: 14 June 2016]

Department of Science and Technology (1996) 'White Paper on Science and Technology' Available at: http://www.esastap.org.za/download/st_whitepaper_sep1996.pdf [Date accessed: 13 June 2016]

Department of Science and Technology (2007) 'Innovation towards a knowledge-based economy. Ten-year plan for South Africa (2008-2018)'. Available at: http://www.esastap.org.za/download/sa_ten_year_innovation_plan.pdf [Date accessed: 14 June 2016]

Department of Science and Technology (2015) 'Annual Report 2014/15'. Available at: http://www.dst.gov.za/index.php/resource-center/annual-reports [Date accessed: 14 June 2016]

Department of Science and Technology (2016) 'Statistical Report 2013/14: South African National Survey of Research and Experimental Development'. Available at: http://www.dst.gov.za/index.php/resource-center/rad-reports [Date accessed: 14 June 2016]

Department of Trade and Industry (2007) 'National Industrial Policy Framework'. Available at: http://www.dti.gov.za/industrial_development/nipf.jsp [Date accessed: 13 June 2016]

Department of Trade and Industry (2016) 'Industrial Policy Action Plan 2016/2017 – 2018/2019'. Available at: www.dti.gov.za/parliament/2016/IPAP_2016-17.pdf [Date accessed: 13 June 2016]

Doblin (2016) 'The Ten Types of Innovation'. Available at: https://www.doblin.com/ten-types [Date accessed: 13 June 2016]

Gauteng Provincial Government (2012) 'Gauteng Innovation and Knowledge Economy Strategy'. Available at: http://www.foresightfordevelopment.org/library/55/1371-gauteng-innovation-and-knowledge-economy-strategy [Date accessed: 15 June 2016]

Hart, Jacobs & Mhula (2013) 'Review of South African Innovation Policy and Strategy 1994-2012: Innovation for Rural Development. RIAT concept paper #3'. Department of Science and Technology and the Human Science Research Council. Available at: http://www.hsrc.ac.za/uploads/pageContent/5094/RIAT2012_ConPaper3policy%20Review%2029%20July%202013%20FINAL2.pdf [Date accessed: 14 June 2016]

KZN EDTEA Innovation Strategy: Draft Situational Analysis. 2016. *S-Squared Consortium*

KZN EDTEA Innovation Strategy: Baseline Innovation Audit . 2016. S-Squared Consortium

KZN Provincial Government (2011) 'KZN Provincial Growth and Development Strategy'. Available at: http://www.kznppc.gov.za/index.php?option=com_content&view=article&id=125&Itemid=159 [Date accessed: 13 June 2016]

KZN Provincial Government (2016) 'KZN PGDS Situational Overview 2016'. Available at: http://www.kznppc.gov.za/index.php?option=com_content&view=article&id=125&Itemid=159 [Date accessed: 14 June 2016]

KZN Provincial Government (2016) 'State of the Province Address'. Available at: http://www.kznonline.gov.za/index.php?option=com_content&view=article&id=120&Itemid=83 [Date accessed: 16 June 2016]

KZN Regional Office of Technology Transfer (ROTT). 2016. Building and supporting technology-based SMMEs in KZN. Draft proposal

KZN Technology Hubs (2016). Available at: http://www.kzntechnohubs.co.za/ [Date accessed: 15 June 2016]

KZN Treasury (2016) 'Status update and feedback'. Available on request from Clive Coetzee. [Date accessed: 27 June 2016]

Lavender, J (2016) 'The 6 key factors to Israel's innovation success'. KPMG. Available: https://home.kpmg.com/xx/en/home/insights/2016/01/the-key-success-factors-to-israelinnovation.html [Date accessed: 15 June 2016)

Morten, T.H. and Birkinshaw, J. Innovation value chain. Harvard Business Review, 2007. https://hbr.org/2007/06/the-innovation-value-chain

National Advisory Council on Innovation (2016) 'NACI Vision, Mission and Values' Available at: http://www.naci.org.za/?page_id=3231 [Date accessed: 13 June 2016]

National Advisory Council for Innovation (2015) 'South African Science, Technology and Innovation Indicators - 2015'. Department of Science and Technology. Available: http://www.naci.org.za/?p=3712 [Date accessed: 15 June 2016]

National Integrated ICT Policy White Paper. 2016. http://www.dtps.gov.za/images/phocagallery/Popular_Topic_Pictures/National_Integrated_ICT_Policy_White.pdf

Ndabeni, L & Rogerson, C. (2016) 'Planning for local economic development initiatives and the potential space for inclusive innovation in distressed areas'. Department of Science and Technology. Available: http://www.dst.gov.za/index.php/resource-center/strategies-and-reports/1719-planning-for-local-economic-development-initiatives-and-inclusive-innovation-in-distressed-areas [Date accessed: 15 June 2016]

OECD (2005). "Oslo Manual: Guidelines for Collecting and Interpreting Innovation Data", 3rd Edition. http://www.oecd.org/sti/inno/oslomanualguidelinesforcollectingandinterpretinginnovationdata3rdedition.htm

OECD (2007) 'Innovation and Growth: Rationale for an Innovation Strategy'. Available at: www.oecd.org/science/inno/39374789.pdf [Date accessed: 14 June 2016]

Pandor, N (2016) 'Minister Naledi Pandor: Science and Technology's Dept budget vote NCOP 2016/17'. The South African Government. Available at: http://www.gov.za/speeches/minister-naledi-pandor-science-and-technology%E2%80%99s-dept-budget-vote-ncop-201617-19-apr-2016 [Date accessed: 14 June 2016]

Shapiro, G (2013) 'What are the secret's behind Israel's growing innovative edge?' Forbes. Available: http://www.forbes.com/sites/realspin/2013/11/07/what-are-the- secrets-behind-israels-growing-innovative-edge/#e0032ce11728 [Date accessed: 15 June 2016]

Smart Cities Council (2015) 'Smart Cities Readiness Guide'. Available at: http://readinessguide.smartcitiescouncil.com [Date accessed: 13 June 2016]

South African Government (2002) 'National Research and Development Strategy'. Accessed at: http://www.cepal.org/iyd/noticias/pais/0/31490/Sudafrica_Doc_1.pdf [Date accessed: 14 June 2015]

South African Government (2012) 'National Development Plan 2030: Our Future – Make it Work'. Available at: https://nationalplanningcommission.wordpress.com/the-national-development-plan/ [Date accessed: 13 June 2016]

South African Government (2016) 'Minister Naledi Pandor hands over mobile computers to schools in uMkhanyakude District' Available at: http://www.gov.za/speeches/minister-naledi-pandor-hands-over-mobile-computer-laboratory-umkhanyakude-district-16-jan [Date accessed: 15 June 2016]

South African Government (2016b) 'State of the Nation Address'. Available at: http://www.gov.za/state-nation-address#2016 [Date accessed: 25 June 2016]

South African Innovation Network (nd) 'About'. Available at: http://saine.co.za/about/ [Date accessed: 14 June 2016]

Statistics SA (2011) 'Census 2011'. Available at: http://www.statssa.gov.za/ [Date accessed: 14 June 2016]

The Durban Hub (2014) 'About'. Available at: http://durbanhub.co.za/about-us/ [Date accessed: 14 June 2016]

The Global Innovation Index 2016. https://www.globalinnovationindex.org/gii-2016-report

Social Innovation (https://ssir.org/articles/entry/social_innovation_creates_prosperous_societies)

Annexure A – Innovation Value Chain

FIGURE 14: INNOVATION VALUE CHAIN (SOURCE: HARVARD BUSINESS REVIEW, 2007)

In the first phase of **idea generation (various sources – business, civil society, academia, government)**, stakeholder collaboration is critical to ensure that good ideas are generated.

In the second phase of **idea conversion**, key stakeholder support is required to screen and fund idea development. In addition, at this stage, ideas are converted into viable products/ services and businesses.

In the third phase of **idea diffusion**, where the developed idea is marketed/ or spread, understanding of key targets markets (stakeholders) is critical to product commercialisation and business sustainability.