

# Regional Innovation System of the Western Cape Strategy Overview

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## List of Abbreviations

<b>COFISA</b> – Collaboration Framework for Innovation Systems between South Africa and Finland
<b>CHEC</b> – Cape Higher Education Council
<b>CPUT</b> – Cape Peninsula University of Technology
<b>DST</b> – Department of Science & Technology
<b>EDA</b> – Economic Development Agency
<b>EDS</b> – Economic Development Strategy
<b>GDP</b> – Gross Domestic Product
<b>HEI</b> – Higher Education Institution
<b>IDP</b> – Integrated Development Plan
<b>IPAP</b> – Industrial Policy Action Plan
<b>IS</b> – Innovation System
<b>LED</b> – Local Economic Development (Plan)
<b>RIS</b> – Regional Innovation System
<b>TIA</b> – Technology Innovation Agency
<b>UCT</b> – University of Cape Town
<b>US</b> – University of Stellenbosch
<b>UWC</b> – University of Western Cape
<b>WAG</b> – Working Action Group
<b>3- Helix</b> – Government – Academia – Industry (private sector)

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## 1. Introduction

The South African economy is faced with a myriad of challenges and opportunities. The role and function of innovation systems are important in helping to overcome these challenges and capitalize on economic opportunities through guiding and governing existing resources to support innovative activities. Understanding where the economy is headed requires understanding the existing innovation landscape and the multiple components that contribute to innovation on various levels. These components can be simplified into: knowledge production and transfer, technological capacity and infrastructure and the wider financial, political and economic environments. These can be understood on multiple levels including national and in this case regional levels. However, even regional or provincial innovation systems can be divided into different levels and components.

The core of an innovation system is driven by knowledge institutions, business, industry and government. Thus it is a systemic marriage and collaboration network between private and public sector entities and institutions. Each of these 'components' play essential roles and have functions within the innovation system as a whole, which in turn is vital for guiding and building the economic system. Governing and managing an innovation system towards a country or region's strategic economic goals and finding solutions for development outcomes can be seen as a major function of the innovation system from a governance perspective. On a micro level, it is about enabling innovation and providing a network of support and stimulation to enhance innovation and entrepreneurial practices. Thus, building an innovation system requires governance and management from the top down and bottom up simultaneously. It requires a systemic understanding of the various forms of innovation which would include an economy wide focus, sectoral focuses, innovation and entrepreneurial nodes, and districts or 'agglomerations' as micro-level focuses. Innovation nodes and agglomerations can be described as geographic areas or spatially oriented innovation that is supported and encouraged to focus on innovation and entrepreneurial activity. They may share resources, infrastructure or marketing strategies. Intermediary institutions such as science parks and innovation hubs and districts are typical examples.

Managing and governing the innovation system requires an understanding of the various systemic weaknesses and opportunities and should aid in providing resources and incentives to strengthen the system. This is usually done via government, funding agencies and economic agencies through policy formulation, financial incentives and institutional support and collaboration, respectively. This document will touch on the various opportunities and highlights strengths and weaknesses within the innovation system of the Western Cape. South Africa and the Western Cape Province have a good potential to enhance their economic performance via recognizing the role an innovation system can play in the strategic governance of available resources including skills and knowledge. The first step will be in recognizing the interactive role government, private sector and academia should play in enhancing current innovation activity and bolstering opportunities for new innovation sectors in the economy. The Green Economy is a prime example with numerous opportunities in the Western Cape due to the abundance of natural resources for renewable energy and knowledge for sustainability.

It is essential that new knowledge, methods and understandings produced at the university are transferred to the private sectors. The universities of the Western Cape and CHEC need to take a substantial lead in ensuring that the innovation system is well understood and governed appropriately. They should also ensure the ease of access to knowledge for society and should provide robust thought leadership and help to guide the innovation system towards a greater efficiency and output.

The Green Economy or clean technology sectors in the Western Cape have potential to become one of the first viable innovation systems for a low carbon economy in South Africa and would be able to provide a suitable base for extension to the African continent. This will require substantial university research and leadership as well as a strong political will. It is not only universities that should play a role, however, and success in establishing a new sector, like clean technology will require effort and collaboration together with industry, business and government also. These opportunities to produce new innovations together with the private sector and to learn to improve existing innovations for African contexts together with global partners should be a priority focus for the province. Despite evidence that domestic infrastructure spending will increase - the export market for infrastructure in Africa is expected to grow extremely rapidly in the next decade or two and thus requires an effective innovation system to manage and capitalize on innovation gaps and opportunities. Most importantly the choice exists today, as to whether the required infrastructure in Africa will be sustainably-oriented or not. Understanding the process of building competitiveness and capacity through the innovation system may result in developing the required sectors like clean technology and sustainable solutions more rapidly to meet the needs of South Africa and Africa (McKinsey 2010).

This document represents a high level strategy overview of what is required to construct, implement and govern various elements of the innovation system. It is however, an introductory overview, which is intended to provide a platform for communicating the meaning of the regional innovation system in context so as to stimulate debate, commentary and further suggestions. This document and the completed work of the 'interim steering committee'<sup>1</sup> which was initially driven by CPUT in collaboration with DEDAT, TIA<sup>2</sup> and DST, will be the starting point for designing, constructing and executing a solid innovation system strategy for the province. This will require continuous research and baseline studies to inform policy and strategy decisions, and will be a long term process.

Building the Regional Innovation System for the Western Cape will once again require support from provincial leaders from all four universities (UCT, CPUT, US, and UWC), government, business and industry or private sector. It will require a substantial budget and considerable effort from all stakeholders across the board. Building an effective innovation system certainly takes time, continuity and relentless effort. Therefore, it requires a committed management body and advisory council who can ensure the effectiveness of the governance of the system and its sustainability. The total effectiveness of the system however, is dependent also upon the level of interaction and collaboration within the system and momentum in achieving strategic objectives. This document focuses on the functioning of a Western Cape

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<sup>1</sup> See Appendix, Box 2 for a list of the interim steering committee.

<sup>2</sup> DEDAT and TIA have been instrumental in providing momentum and support for establishing the Innovation strategy and 'interim' steering committee. The formalization of this committee requires additional representation and presence from all the academic institutions, CHEC, government and big business, and should include innovation, economic development, strategy and sustainability experts.

regional Innovation system in achieving these objectives and highlights the main features of how such a system may operate in the province.

**Section three** gives an upfront summary of the role of the three main components of the innovation system, being the universities, the private sector and government – outlining strengths, weaknesses and opportunities for enhancing the innovation system. In **section four**, a short diagrammatic description is given, explaining the ‘innovativeness’ of South Africa compared to the rest of the world, and gives a brief policy background to innovation in South Africa. **Section five** and **six**, deals with the Western Cape’s strategic economic and developmental goals, and goes on to explain the need for sustainability oriented Innovation systems. **Section seven** explains the form and function of the regional innovation system with some real world examples and explanations. **Section eight**, explains building and maintaining the regional innovation system. The main components of the innovation system are explained and their roles expanded upon with recommendations as to how they may be positioned in the system and what needs to change. A model for the actual functioning and governance of the total system is explained. In the **final section** a short term diagrammatic implementation plan is suggested for the regional innovation system of the Western Cape.

## 2. Aims & Methodology

The **aims** of this report are the following: the **first** is to serve as a communication plan to inform various stakeholders in the province about the Regional Innovation System strategy framework and operational structure. The document therefore takes on an explanatory and informative style. The **second**, aim is to serve as a summary document of previous work that has been completed within the time period of establishing the regional innovation forum. This document thus represents the culmination of this work, and tries to pull together views from numerous stakeholders, opinion leaders, previous studies and international best practice. The **third** aim is for the document to propose a basic strategy for operationalizing the regional innovation system and forum, and to give some direction for the province in terms of a budget item and steps forward. Therefore this document by no means represents the innovation strategy as ‘set in stone’ it is merely the first step in building the innovation system which ought to be a long term project of the province. The **methodology** that was used included: direct interviews with various opinion leaders and stakeholders; the collection of relevant data, numerous recorded minutes of meetings, government documents, academic reports and the private sector studies. Given the time period of one month the study was primarily aimed at giving a summary of previous work done and past and present opinions about innovation within the province.

## 3. Summary of Findings & Recommendations

As already mentioned the regional innovation system consists of a network of components, of which the main elements and relationships can be reduced to collaboration between knowledge institutions; the private sector (business & industry) and government. The general conclusion of this study based on numerous sources is that there is much room for improvement of the innovation system as a collaborative system. Therefore, the roles and functions and relationships between the various ‘main’ components as described above could be enhanced and improved upon. These recommendations, which are a culmination

and summary of numerous reports, government documents and inputs are tabled below and highlight the various systemic strengths and weaknesses of the main components in the provincial innovation system.

Universities and Knowledge Institutions in the Innovation System		
Weaknesses	Strengths	Opportunities
<ul style="list-style-type: none"> <li>▪ Relatively weak collaboration history with industry and government.</li> <li>▪ Poor history of knowledge to commercialization process and channels (lack of institutional support systems).</li> <li>▪ Severe lack of promoting entrepreneurship/incubation programs.</li> <li>▪ Technology Transfer offices primarily only interested in commercializing university IP, till recently.</li> <li>▪ Unclear identity of universities as either 'research' or 'developmental' focus.</li> <li>▪ Alignment of curriculum, collaboration and research not always associated to provincial and industry needs and opportunities.</li> <li>▪ Difficulty in collaboration due to contextual understandings between university long term, big picture thinking and governments' reactionary tendencies.</li> <li>▪ Universities not involved enough in provincial capital and economic development projects. Opportunities for technology development.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Strong knowledge base in Western Cape.</li> <li>▪ Establishment of CHEC, intentions to enhance inter-university collaborations and alignments.</li> <li>▪ Movement towards developmental roles of university identities, engagement with society.</li> <li>▪ A range of 3-helix partnerships do exist, formally and informally.</li> <li>▪ Improved and outspoken intentions of collaboration.</li> <li>▪ Strong learning and graduate output, but not enough to reach status as knowledge economy.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Strengthen concept of 'learning region'.</li> <li>▪ Create <i>de facto</i> incentives for collaboration and partnerships.</li> <li>▪ Clarify collective visions, goals and objectives; establish roles and stick to agreements.</li> <li>▪ To consider the 'knowledge project' of South Africa and Africa – with a focus on knowledge production.</li> <li>▪ Need for formal declaration of partnerships and clear roles – establish inviting atmosphere for business, industry and government.</li> <li>▪ Opportunity for strengthening the co-ordination role of collaboration and research directives through CHEC.</li> <li>▪ Science councils have wealth of patents not being utilized by industry.</li> <li>▪ Innovate the role of Technology Transfer offices – commercialization and entrepreneurship enablers.</li> <li>▪ Incubation programs</li> <li>▪ Joint research facilities (university-private sector).</li> <li>▪ Build 'soft' 3-helix networks and institutional platforms for innovation.</li> </ul>

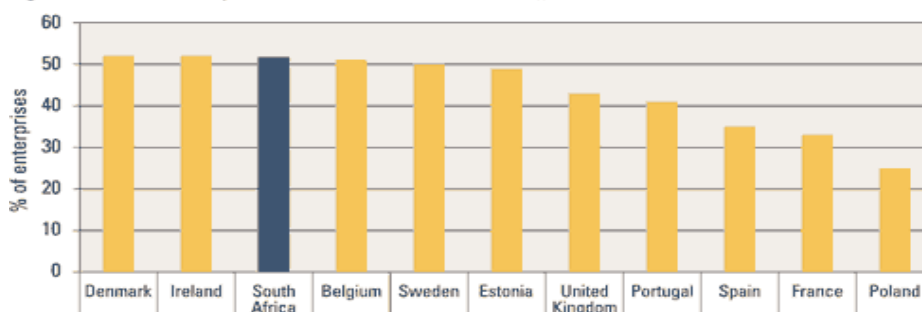
Business and Industry (private sector) in the Innovation System		
Weaknesses	Strengths	Opportunities
<ul style="list-style-type: none"> <li>▪ Generally poor relationships with universities.</li> <li>▪ Value relationships with universities because of skilled graduates and not enough because of research collaboration potentials.</li> <li>▪ Often skewed perception of university research and academia, as too distant from reality or not useful for business.</li> <li>▪ Can improve relationship with government as mentor as opposed to distanced critic. (Is changing).</li> <li>▪ Lack of finding opportunities to commercialize knowledge from universities and patents.</li> <li>▪ Not locally solution orientated enough ie. (huge potential in African markets).</li> <li>▪ Big business not involved enough in dialogue with government and academia together. (joint problem solving and strategizing).</li> </ul>	<ul style="list-style-type: none"> <li>▪ Design capital 2014</li> <li>▪ Strong financial sectors</li> <li>▪ Potential in IT sectors</li> <li>▪ Favourable business climate</li> <li>▪ High entrepreneurial rating</li> <li>▪ High level of inter-business collaboration</li> <li>▪ Interest in advancing Cape Town and Western Cape (ie. High levels of civic duty)</li> <li>▪ Cape Town partnerships</li> <li>▪ Accelerate Cape Town</li> <li>▪ Strong industry sector delineation and clustering with help of SPV's (past).</li> <li>▪ Some collaboration with universities.</li> <li>▪ New sector opportunities (clean-tech).</li> </ul>	<ul style="list-style-type: none"> <li>▪ Improve efficiency, management and resources for sectors and business development with Economic Development Agency.</li> <li>▪ Improve attitudes and perceptions of government and academia through forum dialogues.</li> <li>▪ Capitalize on new sector opportunities.</li> <li>▪ Help to manage and drive EDA process.</li> <li>▪ Aid in creating entrepreneurial culture and incubation programs.</li> <li>▪ More direct involvement in development initiatives – skills training and upliftment programs.</li> <li>▪ Fund specialized research chairs and research for business and industry economic interests.</li> </ul>

Government in the Innovation System		
Weaknesses	Strengths	Opportunities
<ul style="list-style-type: none"> <li>▪ Poor record of top-down mergers and institutional collaboration frameworks.</li> <li>▪ Past confusion as to ownership of innovation mandate and for establishing the RIS.</li> <li>▪ Lack of understanding of innovation systems across the province due to 'new concept' – previous innovation efforts tarnished reputation of government with business.</li> <li>▪ No directorship of innovation in the province. (Champion).</li> <li>▪ Innovation split-up into various directorships in DEDAT = inefficiency.</li> <li>▪ No clear innovation strategy or budget.</li> <li>▪ Experimental phase in setting up 'intermediary' institutions between gov-private sector and HEI's.</li> <li>▪ Not enough funding for research and entrepreneurial development.</li> <li>▪ Not enough focus on enablement of innovation from bottom-up. (changing).</li> <li>▪ Huge developmental issues – requires dedicated focus on long term planning for sustainability.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Reasonable political stability.</li> <li>▪ Institutional restructuring and streamlining.</li> <li>▪ Recognition of Innovation system potentials.</li> <li>▪ DEDAT/DST providing some leadership.</li> <li>▪ Attempts to create public-private research chairs on regional economic and social development issues. (Needs to be reinforced).</li> <li>▪ Good understanding of strengths, weaknesses and opportunities for innovation in the province.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Provide leadership, governance and management.</li> <li>▪ Provide adequate funding.</li> <li>▪ Re-invent funding streams for research – more accessible.</li> <li>▪ Research funding available directly from city and government to universities to support government projects.</li> <li>▪ Enhance university – government decision making.</li> <li>▪ Promote civic science and culture of research.</li> <li>▪ Promote and enable culture of entrepreneurship.</li> <li>▪ Improve basic education and skills levels according to long term economic and sustainable development objectives.</li> <li>▪ Long term innovation planning and strategic alignment to economic and sustainable development goals.</li> <li>▪ Communication and marketing on local, provincial, national and international levels.</li> <li>▪ Implementation of RIS and Forum.</li> </ul>

## 4. Background

According to the Human Science Research Council (HSRC) innovation review, South Africa fairs reasonably well compared to international counterparts. The graph below shows South African enterprises with a share of innovation activity as very high. Although the figures are between 2002 and 2004 which were high growth years for South Africa, it remains optimistic.

Figure 1: Share of enterprises with innovation activities (%), 2002–2004



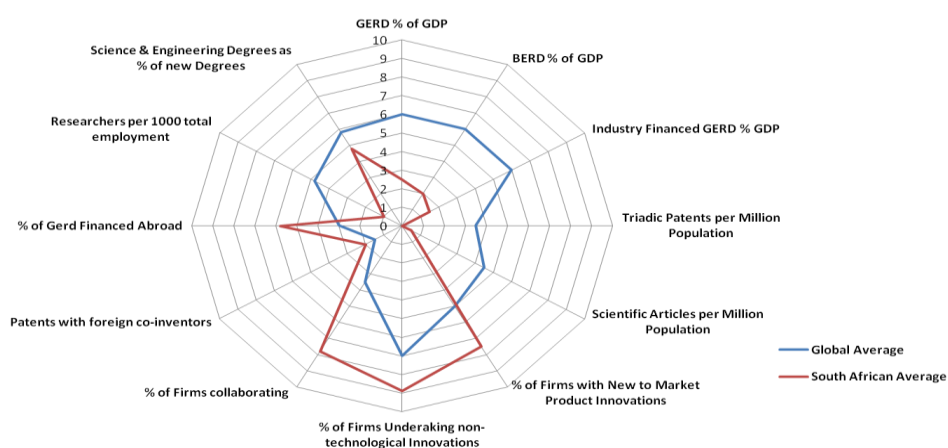
Source: HSRC 2007 ([http://www.hsrc.ac.za/HSRC\\_Review\\_Article-55.phtml](http://www.hsrc.ac.za/HSRC_Review_Article-55.phtml))

A more recent report, published by the OECD in 2010, shows a cross section of the factors contributing to the South African innovation system and research and development performance. In some areas the score is very low, such as *triadic patents per million* and *industry financed gross expenditure on research and development as a percentage of GDP*, as well as total number of *scientific articles published*, which can be



improved upon. These areas therefore require stimulation and government support to enhance innovation performances. Where South Africa does particularly well, in fact probably the best in the developing world is the number of firms placing efforts on non-technological innovations. This is probably due to our status as a developing country and the need to ‘innovate’ for varying social contexts is very high. South Africa also does well when it comes to the percentage of firms collaborating and for introducing mainstream innovation of products to the local market (OECD 2010).

**Figure 2: Cross section of R&D and Innovation Activity, South Africa vs. Global Average.**



Source: van Heyningen 2011, adapted from OECD S&T report 2010

South Africa has a long history of policy relating to innovation and innovation systems. A list of the relevant policy on a national to provincial and local level is found in Appendix Box 3, which includes an explanation of policy strategies for the innovation system. This policy ranges from the 1996, *White paper on Science and Technology* to the more recent *10 year innovation plan*. The regional innovation strategy needs to include both local, regional and national policies such as the *IPAP*, the *Western Cape Provincial Growth and Development strategy*, as well as *LED* and *IDP policies* from local governments. For a more detailed description of the background to policy and intended future strategies please refer to Appendix Box 3.

The **DST 10 year plan** identifies the following “grand challenges” that need to be addressed by South Africa’s innovation system:

- From Farmer to Pharma: life sciences and health
- Expanding the limits of space science and technology
- In search of energy security
- Science and technology in response to global change
- Human and social dynamics, including addressing chronic poverty,

The most relevant aspects of these policy and strategy documents are addressed below.

The premise of the DST **Regional Innovation Systems strategy** is that “global economic growth will increasingly depend on innovation, particularly at a regional level. The need to develop structured and coherent regional systems of innovation, aligned to the development priorities and ambitions of regions, is therefore becoming increasingly important in the quest for global competitiveness and regional economic growth”. The strategy identifies the following action areas:

- Human Capacity Development
- Mechanisms to strengthen and implement RIS
- Provincial and National RIS structures

- Science Parks
- Activators/Centres of Excellence/ Science Centers
- Localisation of large Capex projects
- International Partnerships
- Community Partnerships on Science and Technology for Social Development
- Funding Source

## 5. Strategic Economic Goals

A government of a country cannot develop and attain economic growth in isolation of certain inputs. It requires a network of societal actors and components (as discussed above). It requires knowledge, skills and training; infrastructure and technology as well as various forms of capital including financial, social, technological and natural. Economic growth and stability occurs when all of these 'factors' are working optimally and cooperating as a network or system. Innovation plays a major role in the productiveness, competitiveness and effectiveness of such a system to ensure economic and developmental progress. Innovation systems are becoming increasingly important measures to guide the economy whilst facilitating an ongoing learning and guiding process (Castells 2000; Lundvall & Borras 1997; Lundvall 2007).

### 5.1 The Economic Strategy Plan of the Western Cape<sup>3</sup>

The Western Cape and the City of Cape Town both have an economic development strategy (EDS), which is aimed at guiding the regional economy towards progressive and long term economic growth. The smaller towns and cities of the province also contribute with their own Local Economic Development strategies (LEDS) which are equally important. See Appendix Box 1, for an example of a LED strategy.

The **Provincial Strategic Objectives** rest upon twin pillars of economic development:

- I. The creation and maintenance of an enabling environments for business, and
- II. Demand-led, private sector-driven support for growth sectors, industries and businesses.

Achieving these objectives will require a provincial or regional vision for economic branding of the province. This visioning process, which only forms a part of the provincial enablement efforts is already under way, labeled the **Future Cape Initiative**, which will be supported by the **Cape Catalyst** project. The latter strategy project seeks to provide the economic enabling support required to achieve the Future Cape goals and visions. An example of which is the provision of shared infrastructure, branding and economic clustering to create an attractive destination for businesses and investors (Strategic Plan 2010). The main projects in the pipeline include:

- Cape Town Port Precincts
- Saldanha Industrial Development Zone (IDZ)
- Cape Health Technology Park in Oude Molen/Pinelands
- East City Development Initiative
- Provincial Telecoms infrastructure strategy

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<sup>3</sup> Due to the very recent development of many contributing projects to the province's economic strategy, this chapter is informed by numerous draft documents, studies and interviews with key stakeholders responsible for driving the various initiatives. A sample list of these documents and interviewees can be seen in the Appendix, Box 2.

An **Economic Development Agency** (EDA) which is designed to be separate from the political arena has been proposed and devised for the Western Cape. This is to ensure continuity and professional business expertise in achieving the various economic aims. This EDA will play a central role in the following tasks:

- Coordination of destination marketing for tourism and major events.
- Investment in Trade and Promotion.
- **The tasks below are intended but have not been approved by cabinet yet:**
- *Enterprise Development.*
- *Local Economic Development.*
- *Skills Development.*
- *Growth Sector Support (Micro-Economic Development Strategy).*
- *Asset Development.*

The City of Cape Town region, the largest economic hub in the province has a ten year **Economic Development Strategy** (EDS) that is aligned with the provincial and national strategies. This includes the alignment of a collection of stakeholder visions for the future growth of Cape Town with the New Growth Path for South Africa. The overarching strategy is to focus various resources on key areas that may bear the greatest economic multiplier effects. Furthermore, the various strategic objectives spelt out are as follows:

- To provide stakeholders with a reference point for making long term planning decisions, via a shared economic vision.
- To provide a framework to coordinate and prioritize public investments in Cape Town.
- To provide a source of ideas to inspire stakeholders' actions and their collaborations.

## 5.2 Innovation & Economic Growth

The general consensus is that without economic growth, South Africa and the Western Cape will not be able to meet the basic infrastructure, jobs and services requirements needed to uplift the thousands of unemployed and disadvantaged communities. Thus, economic growth is central to poverty alleviation, job creation and infrastructure investments.

**NOTE:** The rationale behind this document are to beg the questions: ***“Where does innovation fit into these wider economic strategies for the province?”*** and ***“to what extent is it important to achieving the various economic goals and long term visions for economic growth?”*** There is no single or direct answer to these questions and they remain somewhat subjective and dependent on the multiple understandings of what innovation may mean in different contexts or sectors. This document does not seek to prescribe any specific position or definition of innovation, but rather seeks to reveal an overlap in understanding of innovation in the province so that the reader may answer these vital questions for him or herself. Therefore this document seeks to be a working document that will be useful to inform stakeholders in the province and stimulate continuous dialogue about the regional innovation system. This is especially important as innovation is not a static concept or process. This position is determined through the overview study that was conducted prior to the drafting of this document. This included numerous interviews and the assessment of previous studies, documents and most importantly the numerous stakeholder engagement sessions. (See Appendix, Box 2). Setting up the process of establishing the regional innovation system takes time, and thus the work done by the ‘interim’ steering committee has been invaluable to the understanding of innovation in the province. This allowed for an overview perspective to be established as a retrospective and reflexive exercise to recommend policy directions and an overarching recommendation for a strategy to be developed. This work will be continuous and needs a long term perspective. Refer to chapters 5,6 & 7 for a step by step recommendation.

The literature and international experience suggests that innovation and innovation systems are *the* means to enhance economic growth in regions or countries through the strategic organization of resources and institutional arrangements and through building well functioning collaborative networks (Freeman 1998; Lundvall 2009; Geels & Schot 2007). It is suggested that innovation and innovation systems are an intrinsic part of the economic system and contribute significantly to its level of performance or competitiveness, locally, nationally and internationally. It will now be useful to give some definitions of ‘mainstream’ and theoretical understandings of what innovation and innovation systems are in **Box 1.** below.

#### Box 1: Mainstream Definitions and Understandings of Innovation and Innovation Systems

**Innovation:** The OECD is one of the most prominent international bodies influencing policy-making, for innovation worldwide. The manner in which innovation is understood by this organization is primarily market related. In the sense that a new product or service is only an innovation if it reaches the market. Thus patents are not innovations unless they are developed and sold as new products or services. The Oslo manual drafted by the OECD, suggests four classifications of innovations as: **i. Product Innovation:** *new or improved products and services.* **ii. Process Innovation:** *new or significantly improved production or delivery method.* **iii. Marketing Innovation:** *new marketing methods, involving changes in product design or packaging, product placing, promotion or pricing,* and **iv. Organizational Innovation:** *new organizational methods (OECD 2005).*

The definitions cited in the HSRC and DST’s 2005 **South African Innovation Survey** are the same, which indicates that South Africa also prescribes to these formal or mainstream definitions of innovation (HSRC 2009).

**Innovation Systems:** Once again the OECD provides the benchmark or accepted definition of innovation systems worldwide. The recognition that innovation stems from a process and network of interconnected components and relationships gave rise to the study of the innovation system. As innovation does not happen in isolation, it is primarily a network or web of institutions, people and resources coming together to make innovations possible. What is of particular interest is how to enhance the innovation output of regions or nations through the adjustment or governance of the total contributing system. Below is a popular definition of innovation systems. For the OECD set of definitions see Appendix Box 4.

*“.. that set of distinct institutions which jointly and individually contribute to the development and diffusion of new technologies and which provides the framework within which governments form and implement policies to influence the innovation process. As such it is a system of interconnected institutions to create, store and transfer the knowledge, skills and artefacts which define new technologies.”*  
(Metcalf, 1995, cited in OECD 1997).

## 6. Strategic Developmental Goals

Economic growth is certainly not the only development factor for a nation or society. In fact, without focusing on the general well-being of citizens, economic growth will be stifled. Similarly, if a nation or society only focuses on economic growth and neglects to protect, maintain and restore the natural environment and ecosystems it will have an unsustainable effect. Sustainable development is not a side issue anymore, it has to become the mainstream and more rapidly than ever before. This will require tremendous efforts in shifting current unsustainable systems, social perceptions and economic modes of operation towards more sustainable options. Whether these transitions occur radically or incrementally or both, it is going to require

substantial amounts of ingenuity and innovation. See Appendix Box 5, for an explanation of **Sustainability Transitions** and how it is implemented within Dutch policy.

## 6.1 The Western Cape's Strategic Plan

The Western Cape Government recognizes these challenges for sustainable development, and understands that economic growth is ultimately a sub-set and function within society and of the wider environment. Therefore the Western Cape government proposes the following strategic goals or objectives:

- To create opportunities for economic growth and jobs.
- To improve education outcomes.
- To increase access to safe and efficient transport.
- To increase wellness.
- To increase safety.
- To develop integrated and sustainable human settlements.
- To ensure the mainstreaming of sustainability and optimizing resource-use efficiency.
- To increase social cohesion.
- To reduce poverty.
- To integrate service delivery for maximum impact.
- To create opportunities for growth and development in rural areas.
- To build an exemplary provincial governance system.

Realizing these goals and strategic objectives will require a considerable amount of innovation over and above the mainstream or formal definitions of innovation. These goals will also not be achievable through any one branch of government, or through universities or the economic development agency but rather as a collective and collaborative network and system. Innovation for sustainable development includes innovation factors that lie beyond the scope of innovation purely for economic competitiveness.

## 6.2 Innovation for Sustainability

If one is to measure and focus on innovation for economic growth, it is equally reasonable to recognize and try to understand innovation for sustainable development. This could be as simple as shifting the focus of innovations towards sustainability or as complex as trying to develop alternative definitions and measurements. The ultimate goal however, would be to bring these two elements together so that economic growth and sustainable development are the mainstream. No doubt the Province is a long way from this, and therefore requires the distinction and also the effort to build stronger and more efficient sustainability-oriented innovation systems.

### Box 2: Redefining Innovation for Sustainability

**Innovation for Sustainability:** Understanding that the concept of innovation is no longer only associated with economic growth is the starting point. Innovation will play a central role in achieving all forms of developmental, societal and institutional change which is required for sustainable development. Not only technological transition towards clean technology for example, but societal transitions for the more rapid adoption of these technologies is required as a matter of urgency. Experts in the field of innovation and sustainability support this logic including the OECD, which admits that the current definitions of innovation do not cover the entire innovation spectrum. However, due to the lack of consensus and failed attempts to provide accurate indicators and measurements of sustainability it remains a fuzzy concept.

Sustainability does, however, conform to a set of principles and characteristics that can equally be transferred to the concept of 'innovation for sustainability'. These principles can be summarized by the idea that there needs to be at least some normative and calculated direction or ethical considerations in a region or nation's developmental objectives so as to strike a balance between natural systems, human systems and economic systems. Similarly innovation for sustainability should adhere to these principles and in fact recognize that it is the means to achieving such a balance for sustainability.

Defining innovation for sustainability thus includes a broader set of input factors as considerations for the environment and society. The result of these innovation outputs would necessarily shift the trajectory of economies towards sustainability. Such forms of innovation would be either radical or incremental system innovations leading towards the decoupling of resource use and environmental destruction from economic growth (Stamm *et al* 2009). **Decoupling** is a term used to describe the ability of the economy to become more efficient, in the sense of utilizing less resources and creating less environmental pressure whilst the economy maintains positive economic growth. Innovation is a prerequisite for decoupling. (See <http://www.unep.org/resourcepanel/Publications/Decoupling/tabid/56048/Default.aspx> for a detailed UN report on decoupling). The promotion of sustainable innovation is thus also necessary in achieving transitions toward sustainability to aid in solving societal, economic and environmental problems. (Refer to Appendix, Box 5). Both decoupling and transitions are of crucial importance if South Africa and the Western Cape are to adapt to sustainability issues such as global change, climate change, water shortage, food security and societal inequality. In the context of a developing country such as South Africa, both formal and informal measurements of innovation are required.

The logic of Innovation for Sustainability provides a compelling argument in the sense that:

- It often does not require more than a mind shift in the innovation community.
- It consciously brings about the awareness that sustainable innovations are often more competitive in today's world than 'conventional' innovation trajectories (Especially with rising resource costs).
- Ultimately the costs of placing the economy and innovation trajectories on sustainable paths sooner will be far less than later (opportunity costs).
- The more sustainable an economy the more long term competitiveness and resilience it gains.
- A focus on an overarching sustainability innovation framework will also aid in developing new sectors in the economy which is required to diversify the economy from the current and finite minerals-energy complex (Winkler *et al* 2009).

### 6.3 Sustainability-oriented Innovation Systems

As yet, there is no internationally accepted definition for Sustainability-oriented Innovation Systems (SoIS). There is however a need to reach consensus on the role of SoIS as opposed to conventional innovation systems. Some see SoIS as a component of the wider regional or national innovation system or as one sector of the innovation system, for example, the clean technology industry. However, there is certainly a need for including an economy wide focus as well as sector specific and spatial innovation focuses (See Montalvo 2009; Stamm *et al* 2010).

A theoretical model for Sustainability oriented Innovation Systems is depicted below. This is briefly described by three nested spheres and interactions between knowledge production and learning, technology, infrastructure, resources, finance, institutions and the wider environment including society, ecology and economy. **Sphere 1:** Shows how innovation systems and the economy today are related to

knowledge production and learning. Knowledge production is no longer understood as a linear transfer process from university to society or firm. Knowledge is produced in collaboration with government, universities and industries as a 3-helix network within society. The aim of the innovation system is to enhance such collaboration and networking to ensure a flow of knowledge and learning to foster an innovative culture. **Sphere 2:** depicts the various socio-technical and socio-economic resources as well as institutional arrangements required to make knowledge effective for innovation. This may range from technological resources for advanced research and development to various infrastructures such as ICT and roads and energy resources, and of course also financial incentives. It is therefore the role of government and private sector to ensure the necessary institutional arrangements, environments and incentives to create a culture for innovation. Hence policy for innovation is vital, and should be directed at achieving the macro- and micro-economic goals of the province and country. The interaction between Sphere 1 and 2 is what already takes place in the economy; however, it is the role and function of an innovation system to ensure it works more effectively. This requires understanding the systemic weaknesses in the network of collaboration and transfer of knowledge within and between these various spheres. Finally, it is extremely important to realize that the functioning of an innovation system (ie. Spheres 1&2) are to a large extent dependant on the wider economy, society and environment itself, depicted as **sphere 3**. Therefore innovation policy and innovative communities need to take into account global and national macro-economic trends and opportunities to help guide the local innovation sector trajectories to ensure strategic advantage. Similarly, design within innovation processes in today's world has to consider the environment and society. Together this system comprises a sustainable and sustainability oriented innovation system which ultimately leads to greater economic competitiveness. The opportunity costs of not shifting towards such a system now will rise incrementally to the point where the economy will not be functional due to economic inadaptability or resilience.

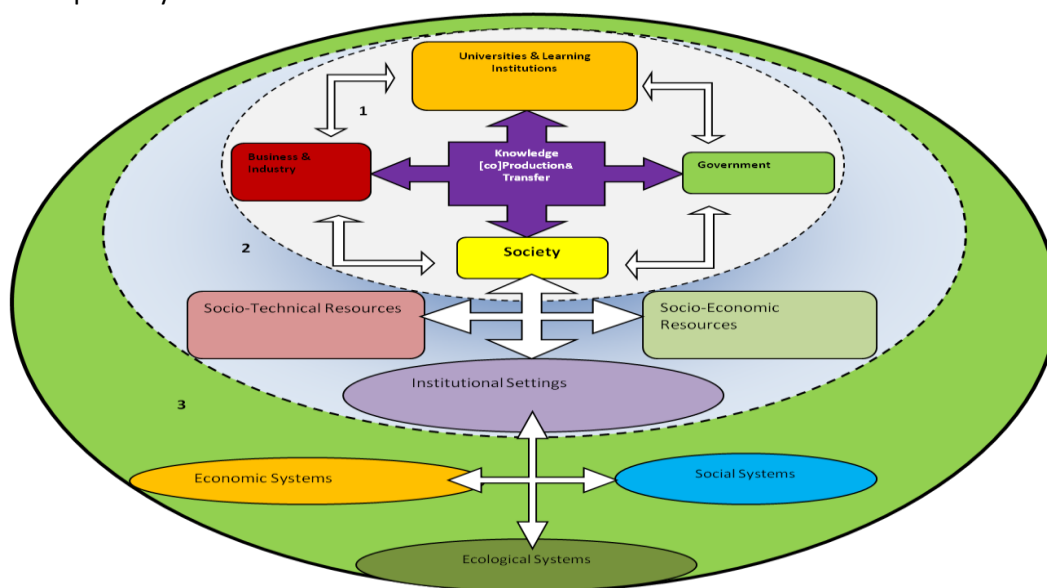


Figure 3: A Theoretical Model of a Sustainability Oriented Innovation System

Source: van Heyningen 2011

If innovation systems in the past were geared towards enhancing the competitiveness of the firm and economy, today, especially in the developing world, it is much more than that. It is about achieving



economic growth that does less harm to the environment and includes people into the formal economy. It is and should be about achieving sustainable economies and communities. Therefore, innovation and innovation systems are more important than ever before to not only solve the problems in society, but to turn these problems into economic opportunities.

#### Real World Example 1: Turning Social and Environmental Problems into Economic Opportunities

In 2006, Durban was faced with overburdened landfills and municipal waste streams that cost the taxpayer millions. Through innovation efforts, ingenuity and public-private partnerships the eThekweni Municipality<sup>4</sup> managed to transform the costly waste system into a world-class example of waste management with economic gains. Today these landfill sites are regarded as economically viable and a true example of sustainable innovation. Through harnessing and burning the natural gas that is produced in the landfill, up to 10MW of electricity is produced and sold to users in the city. Thus both a social and environmental problem was turned into an economically viable solution ie. Sustainable Innovation. These innovations are sustainable in that they burn up the landfill gas which is 21 more times harmful than Co<sup>2</sup> and there are several Material Recovery Facilities (MRF's) that sort the various waste types coming in whilst making it easier to recycle plastics, glass and paper it also reduces the amount of waste ending up on the site. This is also a labour intensive process and produces numerous jobs, whilst extending the lifespan of the landfill. Overall the project is a great example of a 'sustainable innovation' that seeks to turn environmental and social problems into economically viable solutions. Presently the City of Cape Town and Stellenbosch Town for example have similar problems with their waste capacity that Durban had several years ago. Several innovation opportunities now exist for these sites as well.



## 7. The form & Function of the Regional Innovation System

Innovations have no value unless they are adopted and diffused within the market and society. Therefore innovation systems should have two primary objectives:

- **To enable innovations in the province and,**
- **To aid in the diffusion of innovations in the province or elsewhere.**

Innovation systems are primarily defined by their operational environment or context, contributing factors or components and their functions. They can either operate on a national level, a regional (provincial) or local level (See Lundvall 2009). However, innovation systems also can be sector specific. As already mentioned previously, innovation has different meanings in different contexts and focuses. This guideline strategy document thus proposes the following 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).**

<sup>4</sup> See <http://www.durban.gov.za/durban/services/cleansing/gastoelec/landfill> for more information on this project.



**NOTE:** In this chapter we will give a brief overview of each of these focuses mentioned above and give examples of how the regional innovation system may contribute as a supporting framework and governance system. Policy recommendations are to take into account the differences within the various innovation focuses. This will require in-depth study of each innovation focus to understand the general innovation climate, opportunities and constraints and how the innovation system governance structure may support these focus areas as each will be different.

In the literature the manner in which innovation systems are classified and understood are either through the component approach, which seeks to map out the components of the system, or/and through the functional approach, which seeks to assess the primary functions and outcomes of the innovation system (Lundvall 2009). Below we give a brief description of these distinctions and apply it to the Western Cape model as an example. The innovation strategy roadmap, described in the next chapter will need to map out, and assess all the components, their interactions and functions in the entire province. This would also be an ongoing monitoring and evaluation function to aid in the governance of the innovation system.

<b>Box 3: A comparison of components and functions of an Innovation System</b>	
<i>Component Approach Examples:</i>	<i>Functional Approach Examples:</i>
<p><b>Society:</b></p> <ul style="list-style-type: none"> <li>▪ Social innovation</li> <li>▪ Entrepreneurship</li> </ul> <p><b>Knowledge Co-Production &amp; Learning:</b></p> <ul style="list-style-type: none"> <li>▪ Cape Higher Education Council</li> <li>▪ Universities (UCT, US, UWC, CPUT)</li> <li>▪ Colleges &amp; Technical Training Schools</li> <li>▪ FET's (eg. Northlink College)</li> </ul> <p><b>Government:</b></p> <ul style="list-style-type: none"> <li>▪ National, Provincial &amp; Local levels</li> <li>▪ Government Departments (eg. DED&amp;T; DST; DTI)</li> </ul> <p><b>Agencies, Organizations &amp; Institutions:</b></p> <ul style="list-style-type: none"> <li>▪ Technology Innovation Agency</li> <li>▪ Economic Development Agency</li> <li>▪ Cape Chamber of Commerce &amp; Industry</li> <li>▪ WESGRO</li> <li>▪ Cape Town Partnerships</li> <li>▪ Accelerate Cape Town</li> <li>▪ Future Cape</li> <li>▪ Cape Catalyst</li> </ul> <p><b>Business &amp; Industry:</b></p> <ul style="list-style-type: none"> <li>▪ Special Purpose Vehicles (e.g. Boat Building Industry; BPO; Cape Tooling; Green Cape)</li> <li>▪ Businesses</li> <li>▪ Finance corporations, Venture Capitalists &amp; Banks</li> </ul> <p><b>Innovation Environments or 'Innovironments' &amp; Agglomerations:</b></p> <ul style="list-style-type: none"> <li>▪ Traditional Science &amp; Research Parks (e.g. Cape Health Park; Belcon Science Park)</li> <li>▪ Innovation Hubs &amp; Districts (e.g. Fringe Project; Technopark/Stellenbosch)</li> <li>▪ Cluster Developments ( e.g. Atlantis eco-industrial park; Capricorn Park)</li> </ul>	<p><b>Society:</b> Is a very powerful driver of innovation. In times of need or pressure society has produced exceptional innovations. Innovation is essentially a social process and thus it should be recognized in all the components and functions below. Societies are also the intended recipients of innovation and learning.</p> <p><b>Knowledge Co-Production &amp; Learning:</b> It is the role and function of universities and learning institutions to ensure that there is a skilled and educated workforce as well as research provided to stimulate the economy. The function of knowledge production is not limited to the university and includes also technical training colleges and further education colleges. It is their function within an innovation system to ensure that the industry and business needs are met in terms of skills and research. It is also their role to ensure society is included in learning and knowledge transfer to provide stimulus for an innovation culture.</p> <p><b>Government:</b> The role of government is to provide support and allocation of resources (physical &amp; financial) to enhance innovative activity in the province. It is also their role to ensure guidance and governance of the system in collaboration with other stakeholders. Innovation policy, programmes and incentives are also a central function of the government at various levels.</p> <p><b>Agencies, Organizations &amp; Institutions:</b> These components are also vital for the functioning and execution of policy programs and the general functioning of innovative activity in the province. These specialized institutions together form a vital network of support and stimulation.</p> <p><b>Business &amp; Industry:</b> These are the recipients of innovation system support. Their primary function within the innovation system is to innovate and collaborate with the wider system components. They are also enablers of innovation themselves as they take up new knowledge and transfer it into economic viable innovations, patents and services. Entrepreneurship within and between business is also a major catalyst of innovation. Many new start-ups come from the business and industry sector itself rather than universities.</p> <p><b>Innovation Environments or 'Innovironments' &amp;</b></p>

<ul style="list-style-type: none"> <li>▪ Online (CITI; Bandwidth Barn; Silicon Cape)</li> </ul>	<p><b>Agglomerations:</b> Their function and existence are vital for stimulating a social environment for collaboration, technology transfer and establishing a culture for creativity and entrepreneurial innovation activities. It is also important for developing nodes of excellence and societal learning and identification.</p>
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## 7.1 Promoting Economy Wide Innovation

This focus is about promoting innovation across the board, which includes all sectors and activities. Therefore, it requires understanding methods and means to promote a culture of innovation. This also requires building capabilities, capacities, general education and training to the population of the Western Cape. It can also be interpreted as innovation within the governance structure of society, re-arranging various institutions, promoting innovation and learning through policy and tax incentives. Coupled to the focus on economy wide innovation is certainly entrepreneurship and access to institutional and financial support. Often great innovative ideas come out of communities in society and this requires a network and a central support system. This may be in the form of 'innovation districts' or 'incubators' or 'living labs' (See COFISA 2010).

### Real World Example 2: Promoting Innovation across the Economy

**Currently:** The Department of Science and Technology has for some time now promoted innovation within the private sector by supplying a one-hundred and fifty percent tax rebate for any internal R&D. This is aimed at promoting innovation within firms and various sectors across the economic spectrum. Furthermore, funding providers such as the Technology Innovation Agency (TIA) and DTI's THRIP programme incentivized innovation within the country and province. The purpose of the Technology Innovation Agency (TIA) is specifically to interface between innovators on the ground level and to provide them with funding and grants to lessen the innovation chasm and to push innovations to market. The TIA also has the objective to promote a culture of innovation by implementing enablers within the macro-environment. They will play a vital facilitation role within the regional innovation system.

**Potentials:** The current attempts to finance collaborative research between universities and industry to stimulate innovation could be enhanced or formalized locally; so as to reinforce a culture of university-industry collaboration. Government could incentivize small and micro sized enterprises to open innovation centers and platforms to share ideas and collaborate and build entrepreneurial cultures in partnership with universities and learning institutions. The establishment of the regional innovation forum will be crucial in providing a central platform to meet and collaborate for innovation. Online functionalities and expertise from visiting countries would aid in bringing awareness to potential innovators. Communication and marketing of the innovation system itself is a fundamental priority. Feedback and contributions of innovators to formulating progressive policy and being involved in the innovation policy and governance structures will also be crucial.

## 7.2 Promoting Sector Specific Innovation

In the Western Cape there are several well-functioning sectoral innovation systems that are under the management of Special Purpose Vehicles (SPV's) and their CEO's (although this is going through a process of restructuring and contestation, the outcomes of which are being determined). Innovation within each of the industry sectors in the province varies somewhat. Despite each sector already having functioning innovation

systems, the innovative performance of each sector has the potential to be enhanced. This is dependent upon the various resources that are available to the sector both internally and externally. Often innovative solutions within sectors come from effective and complementary collaboration with other sectors, despite the transaction costs of collaboration.

The sum of all the sectoral innovation systems usually makes up the majority of innovative performance in a region or province. The role of the wider innovation system's governance structure is to remove obstacles and enhance possibilities to innovate, enable and grow the sector. This may include the following functions:

- Policy adjustments, alignments & governance actions (to remove blockages and bottlenecks).
- Identify and address, sector specific skills development and training.
- Sector specific innovation incentivization schemes.
- The provision of specialized capital and technology for sector specific innovation.
- Matchmaking and merging sectors with other sectors to innovate and form new industries.
- Absorbing the transaction costs of sector and knowledge matchmaking and collaboration.
- Specialized research focused on sector specific technologies, social and organizational processes.

**NB: Please refer to Appendix Box 7 for a breakdown of innovation weaknesses, strengths and potential in a number of sectors within the province.**

### Real World Example 3: Promoting Sector Specific Innovation

**Currently:** As already mentioned there are numerous Special Purpose Vehicles (SPV's) in the province dealing with the enablement and support of numerous sectors. Some of which include the following:

- Business Process Outsourcing
- Oil and Gas
- Cape Tooling Initiative (Advanced Manufacturing and Engineering)
- Green Cape Initiative (See [www.green-cape.co.za](http://www.green-cape.co.za))
- Cape Craft & Design
- Boat Building Industry...

However with the advent of the Economic Development Agency a number of these SPV's may be dissolved. Importantly the structure of the SPV's still remain and could also be very useful for building upon as various sectoral innovation systems.

As many of these sectors function quite well already, they may ask the question how would inclusion in the wider innovation system benefit them? This in many ways depends upon their understanding of innovation and their desire to innovate. As innovation is often quite narrowly associated with R&D type investments in the firm or industry it is often seen as a cost. However, organizational restructuring to ensure more effective processes and functions within the firm and sector are also innovation and often require very little expenditure. Thus there is always room for innovation and the ability of a firm or sector to innovate either relies upon its own internal set of resources or it has to seek external resources. These resources usually refer to people and their ability to generate ideas or solve complex problems. Often, innovation occurs within firms or sectors when there is a great need and the firm seeks answers from elsewhere and is then able to innovate to survive or increase its competitiveness.

The logic of sectoral innovation systems being a part of the wider innovation system is to provide a continuous network of external stimulus and support. The closer and more accessible the web of external resources and collaboration platforms are available to the various sectors or firms the easier it is to create new ideas, share knowledge, learn and innovate. This is of course on a voluntary basis, as the transaction costs of involvement also need to be included. This does not mean that companies would compare notes in terms of sensitive information that may jeopardize their competitiveness. Rather it is about being open about how they may learn from one another or gain ideas from complementary processes. It is precisely

the role of the innovation system governance structure to provide this stimulus and support.

**Potentials:** There are vast potentials in South Africa and the Western Cape when it comes to collaboration. There is fairly poor collaboration between different industries and competing companies. Whilst there may be some form of informal collaboration between the government, academia and business, few formal arrangements exist. As has been shown through many examples from around the world the more collaboration the greater amount of innovation. There is much potential to use the regional innovation system structure and proposed forum to enhance institutional collaborations between firms, sectors and with government and academia. There is also good potential to create specialized institutional and financial arrangements to stimulate such collaboration, or joint innovation projects. Furthermore, the possibility of engineered locations and spaces to attract collaborative behavior is already a possibility and is already in the planning phases. Refer to real world example 5 below.

### 7.3 Niche and Novelty Innovation Sectors

New to market innovations require the most support and nurturing, especially in developing countries like South Africa. Strategic niche management is an area of expertise that deals with the governance and management of niche technologies, services or products. Strategic transition management deals with the ability of sectors in the economy to shift towards sustainability and is also an important role of the Innovation system (Loorbach & Rotmans 2010).

Strategic niche management should be seriously considered as a part of the governance of a regional innovation system, as it may mean the difference between success and failure of an entire emergent sector. Often these emergent sectors require special external attention to aid the sector in its maturation process. Many technologies or niche innovations do not reach the market despite their massive potentials due to various blockages and often require additional governmental assistance.

#### Real World Example 4: Promoting Niche & Novelty Innovations

**Currently:** Currently in South Africa a good example of a niche innovation is the development of micro and medium sized satellites. Sunspace, a company that spun-out of Stellenbosch University's satellite program is a good example of a niche innovation. Most satellite production globally is driven to the international market with the aid of their national governments. This is to ensure the long term viability of the sector through financial and political support. At the moment Sunspace is receiving support from the Department of Science and Technology to enhance the capabilities of this sector. These niche innovation environments are important in that they not only represent real opportunities to put South Africa on the map internationally, but also to inspire young budding scientists and engineers.

**Potentials:** As the South African government is still in a learning phase with regards to the support of niche technologies and innovations. It may require a specialized team as an intermediary set of experts to manage niche technologies as well as transitions. The management of strategic niche areas are highly specialized exercises and thus require high level skills and professional guidance. Such an exercise can be included in the function of a regional innovation office.

### 7.4 Entrepreneurship and spatial agglomeration

Silicon Valley is now a household name, which represented the first and most successful Science Park to date. This spatial agglomeration or innovation milieu as Manuel Castells (2000) describes it did harbour some critical success factors. These included amongst many other factors the presence of University leadership and knowledge, the availability of finance, a business culture, niche and novel innovations which

were a product of high level skills and research. Silicon Valley may not have happened had these critical factors not merged to form a network of innovation multipliers in a specific location – Stanford Science Park. Similarly, today there are numerous forms of science parks, innovation hubs, districts or creativity zones within cities, in all forms shapes and sizes. The key to the success of these agglomerations is to bring together certain institutions and organizations for mutually beneficial reasons and to create a culture of research, entrepreneurship and innovation. The spatial component remains important as the area gathers an identity with which certain types of innovative firms and individuals are drawn. What is of utmost importance for the establishment and success of these spatial innovation nodes is to realize their essential human requirements and social aspects. For example it is vital to ensure that the surrounding areas are attractive places to live, work and play.

#### Real World Example 5: Creating Innovation Environments

**Currently:** The Collaboration Framework between Finland and South Africa for the establishment of Innovation Systems (COFISA) between 2008 and 2010 resulted in a number of strategic objectives for the Department of Science and Technology and the national government. One of these objectives is to realize a strategy plan for innovation in each province (hence this strategy overview document). This culminated in the guidelines for establishing regional innovation systems and forums, which are meant to link up to national efforts at establishing a national innovation system. Several studies were conducted during the collaboration phase, one of which centered on the potentials and status of science park activity in the Western Cape and the Triple-helix networks (See COFISA 2007; 2009; 2010). At present there are no well established Science Park activities in the province. However, there are plans to establish a Cape Health Park as well as more elaborate plans to establish the Belcon Science Park. An Innovation District labeled the ‘Fringe’ project represents an urban science park or district, which is in the advanced stages of planning.

Technopark in Stellenbosch, which was the first attempt at establishing a science park in the country remains a potential location for innovative activities. Currently there are serious attempts at re-inventing the park so as to increase its collaborative role with the University of Stellenbosch and bolster its image as more than a normal business park. This park is in a prime position to upgrade towards an innovation hub. The concept however, has grown to include the whole town and region of Stellenbosch as an ‘Innovation district’ for sustainability-oriented innovation and entrepreneurship.

**Potentials:** What makes science parks and innovation hubs special is precisely their characteristics of forming multiplier effects in terms of bringing the right people together in one location. Most often science parks have a specific industry focus, for example ICT or biotechnology. However, the concept of a science park or innovation hub today is in itself in a process of innovation. There are new ways of bringing together innovative people, organizations and institutions to collaborate, share ideas and innovate. Sometimes there is no need for creating expensive and specially designed science parks. Apart from specialized parks such as the Cape Health park, innovation hubs need not be newly constructed facilities. In addition the concept of utilizing and upgrading existing infrastructure of cities and towns should be explored. The proposed Stellenbosch Innovation district including Technopark as the central driving force behind a modern concept of a productive innovative town is a good example. These kinds of initiatives however, require careful planning, research, buy-in and leadership. In turn they should become the cauldrons of creative and innovative energy so as to catalyze the future economic activities for the province and the country. Furthermore, and most importantly these nodes or ‘innovironments’ should begin to form an innovative network between themselves, simultaneously shaping a societal culture of problem solving, critical thinking and entrepreneurship.

**Idea Labs, Incubator Systems & Entrepreneurship:** Coupled to these innovation spaces, or ‘innovironments’ is the need to create a societal and institutional support system for ideas, creativity and

entrepreneurial activities. Such a system is called an incubator system because, it is an entrepreneurship program that happens in stages of *i) idea generation* (nursery) *ii) Business plan development and execution* (incubator) and *iii) growth and investment platform* (accelerator). The reason for this is, that it reduces the chances for failure, as the new entrepreneur has a channel to follow a step by step process where he or she can learn from other business colleagues who have been successful or failed previously. Furthermore, having an entrepreneurship support system in stages means that if the entrepreneur does fail, he or she has some kind of safety net and does not crash out completely.

**Competitions:** The city of Cape Town is currently seeking to strengthen its existing entrepreneurship networks and has committed R1,8 million to this cause. The city is seeking entrepreneurs in the field of Biotechnology, Telecom and Media, Clean Technology, Healthcare and Social Entrepreneurship. Initiatives like these should be encouraged, monitored and improved upon for replication on a smaller scale around the whole province. Stellenbosch has also recently launched the **Stellenbosch Ideas Competition**.

**Hypothetical example:** Themba is a university student about to graduate from her BCom degree, she has what she believes to be a brilliant business idea. Before she graduates, the young entrepreneur goes to the 'idea lab', whereby she can test her ideas in the presence of experienced business coaches and colleagues to see if she should pursue this further. Perhaps to develop her ideas further and improve upon them for a later chance in life. A set of facilities are available whereby she can use the open space for free, has access to shared computer facilities and all office services. If her idea is developed well enough, she can enter a competition and stand a chance to win some start-up capital and join the 'incubator' program. At the incubator, which is stationed near campus at the university, she realizes her idea is really good and now she is serious about starting this business and winning the competition. In fact she joins with a friend who had a similar idea and together they begin to finalize their business proposals to apply for some more funding. They manage to out-compete all the other entries which were seventy in total, they win the cash prize! After a year, they have managed to set themselves up in the small offices provided by the incubator and pay only a minimal fee of R 100 a month. Their business begins to grow and they are seeing some real returns. After two years they can apply to move to more mature facilities in the business accelerator where they are in a cutting edge business environment. They continue to grow their business with the help of some expert business developers and gain exposure to some big opportunities. Some of the local businessmen are very interested in their products and offer to loan them R 500 000 to expand their business. However, they decide to make a sales pitch at the bi-annual investor showcase event. They manage to crack it, and an investor decides to provide them with a loan of R 2 Million. Ten years later they are a multi-million rand business employing thousands of people. Thanks to the incubator system they succeeded!

## 8. A Strategy for Building and Maintaining the Regional Innovation System

This chapter provides a guideline for the required strategy to build and maintain the Regional Innovation System in the Western Cape. This includes commentary on existing efforts in the province and makes recommendations on ways to move forward to consolidate the system. This includes mapping out the machinery (components), functioning and governance of the system in the province and providing recommendations for further research and development of the system. The various priority areas and starting points are also highlighted in a phased approach. Of extreme importance to the successful functioning of the RIS is a professionally managed *Regional Innovation Forum* to facilitate and incentivize collaboration and communication. Finally, if policy is not aligned with need and provides a blockage to investment in the province it will stifle innovation, diffusion and economic growth.



**NOTE:** This strategy is only meant as a guideline document for discussion, criticism, inputs and communication purposes. It does not represent a detailed and comprehensive strategy for the province's innovation system but rather an overview of the intended direction for the system. This strategy does include suggestions and research recommendations as to how to build the initial phases of the Regional Innovation System. It must be understood that building a well functioning innovation system requires delivering on multiple tasks on multiple levels. Eventually it is the effective governance and leadership of the system that determines the success and ultimately the purpose of the Regional Innovation System and Forum.

This chapter is based upon a limited time of research of previous studies done on setting up the regional innovation system as well as several key stakeholder interviews. Therefore, their opinions and understandings of innovation may be expressed in this chapter and document. However, they will not be referenced. For a list of people interviewed, please refer to Appendix Box 2. These views are only to be regarded as personal opinions of various stakeholders and do not represent the views of the author or any formal institution.

## 8.1 Stakeholder Roles & Responsibilities

The roles, responsibilities and level and quality of collaboration between the various components or stakeholders in the Innovation System determine its effectiveness. In **Box 3** above, the function of the various components are highlighted in a more theoretical or ideal perspective. The basic understanding of what is required in the Western Cape to build a well functioning innovation system is prescribed and commented on below. Here only the major stakeholders and components will be discussed in brief as an overview. This document is not intended for detailed and in-depth commentary but does draw from an in-depth understanding of the total innovation system requirements.

### 8.1.1 The role of Universities in the Western Cape Innovation System

- 1) See also **Box 3** for roles and function of Universities.
- 2) Although universities are making a greater effort to re-position themselves within the 'developmental' role there remains a perception of disconnect with the other stakeholder groups in society. It is evident that the Universities themselves recognize these issues and are currently trying to reposition and expand their services to local society. Stellenbosch University has recently launched the Hope project (<http://thehopeproject.co.za>) which seeks to use science and research to help solve social and developmental issues. It would be quick to judge the success of this project. However, at present there is much room for improvement between University-Industry and business relations which does not feature very strongly currently, especially smaller enterprises in surrounding areas. UCT, has similarly launched a knowledge for society program (<http://www.knowledgeco-op.uct.ac.za/about/>).
- 3) The role of universities are very important in the innovation system, especially where thought leadership, knowledge generation, learning and transfer of knowledge is concerned. The universities will have to work hard to change their public image and the perceptions of other stakeholder groups. The manner in which this can be done is through specialized institutions and providing collaborative finance for collaborative research. Innovation hubs or innovation centers and incubators can be the physical location to bridge this gap as well.
- 4) The Cape Higher Education Council (CHEC) should also be playing a major role within the innovation system to ensure collaboration between the universities research programs and curriculums. This system in itself can be a major contributor to knowledge creation and transfer, which is important for the effective functioning of the innovation system, planning and governance. University research aims, should also serve the greater developmental aims of the Western Cape, which in many cases they already do. This needs to be communicated and made explicit to the public and coordinated well through CHEC.

- 5) Finally, it is not only universities that produce knowledge. The innovation system's functioning includes many forms of knowledge and experience. Tacit knowledge and experience cannot be learnt at the university for example. Therefore various kinds of knowledge required for an effective and productive innovation system needs to be taken into account. Universities together with government should recognize the need for skills development, internships and training for future sectors in the economy and organize accordingly. Vocational skills and technical knowledge from the school level up needs to be emphasized if the Western Cape is to diversify its knowledge base. New graduates should also know where to go to find job opportunities and training programmes for enhancing their careers. Enticing international skills and expertise should also form part of the increased drive for a knowledge economy.

### 8.1.2 The role of Government in the Western Cape Innovation System

- 1) See also **Box 3** for the roles and function of Government.
- 2) The government has taken the lead role in establishing the Regional Innovation Forum. Together the Department of Science and Technology, the Department of Economic Development and Tourism and the Technology Innovation Agency set the process in motion. A wide range of stakeholders were consulted and numerous workshops were held to get to grips with the understanding and function of innovation within the province. See Appendix Box 6 for a detailed background description and timeline of the process to date.
- 3) The functioning of the regional innovation system should try to be void of politics to ensure professional long term management and continuity. The role of government should thus be a partner in enabling innovation environments, structures, policy, legislation and support.
- 4) Government should have a specialized liaison team or unit to ensure rapid policy formation. The usefulness of which is to ensure an influx of investments in innovative projects. Currently there is a large amount of 'red-tape' which hampers innovation and investment processes. The government is aware of this issue and have launched a program called 'red tape to red carpet' to specifically deal with this and improve investments (both national and international).
- 5) Government should also play a part in the advisory position to ensure that social, economic and environmental development goals are considered within innovation trajectories, incentives and planning. Although an advisory committee should be separate from government, it should contain high level government officials and key policymakers. The current structures of the national planning commission could also be consulted to ensure alignment with national priorities and goals.
- 6) The largest role of government should be in providing financial, institutional and policy support for the governance of the regional innovation system. This may be directly or indirectly through government agencies, bureaus or institutions.
- 7) It is also the role and responsibility of the government to aid in the communication and marketing of the innovation system. This includes communication between all the stakeholders, but especially between various departments and policy makers in the various government tiers. This is to avoid duplication efforts and to streamline the innovation enabling factors in and between departments.



### 8.1.3 The role of Business and Industry in the Western Cape Innovation System

- 1) See also **Box 3** for functions and role of business and industry
- 2) Business and industry play quite a different role to that of university and government. In fact they play the largest role in the innovation system in the sense that they make up most of if not all of the innovative performance of the innovation system. Universities play more of a facilitative role regarding knowledge and learning and governments play more of an enablement role through governance and policy making. Business and industry are then the recipients of innovation system support and governance. For example, where there is a need for skills and training in a certain sector, it should be the role of government and universities to provide the required resources.
- 3) Most innovation occurs within the business and industry environment, and often it is due to the adoption of new knowledge from various sources. Innovation also often occurs at the fringes of these sectors and where they seek new opportunities and partnerships. It is their role to inform the other players or innovation stakeholders about what is effective and working for them and where the strategic opportunities lie for innovation in the province. Therefore, it is very important that the business and industry communities exchange their experiences with universities and government on a collaborative and voluntary basis.

### 8.1.4 The role of Intermediary Institutions, Organizations and Agencies in the Western Cape Innovation System

- 1) See also **Box 3**, for the role of Intermediary Institutions, Organization and Agencies.
- 2) The scope of this document does not allow for a detailed description of the role of all of these 'intermediaries' as described above. However, it is important to mention the brief overview of their role and function in the Western Cape. Their primary role within the innovation system is to play an intermediary or in-between and often neutral role that neither, government, academia or business assumes. Mostly these are in the form of NGO's or development agencies which serve as catalysts for new ideas and differentiated understandings which often leads to innovation. They are important because they often bridge the gap between the primary stakeholders (mentioned above) in the innovation system. They are smaller, more mobile, effective and innovative.
- 3) In many ways these 'intermediary' institutions do not contribute to innovation directly but play a vital role in the fostering of innovative outcomes and encouraging an innovative culture within society.
- 4) Good examples of these are the Technology Innovation Agency, the Economic Development Agency, Cape Town Partnerships, the Sustainability Institute and Khuyasa. All of which contribute and add to the innovative performance of the total system. In essence these intermediary institutions act as catalysts to enable and support innovation.

### 8.1.5 The role of Science Parks, Innovation Clusters and Hubs

- 1) See also **Box 3**, for the role of Science Parks, Innovation clusters and Hubs.
- 2) As do the above 'intermediary' institutions fulfill a role in the innovation system across the spectrum. Innovation hubs and agglomerations often provide the engineered spatial location for the execution of innovative activities. These innovation spaces are characteristically led by research and learning institutions. They also represent a strong bond between the triple-helix network of government,

industry/business and academic collaboration. Often these hybrid components in the innovation system result in a multiplier effect of innovative activity.

- 3) Although there have been attempts at establishing science park activity in the past in the province, they have not been entirely successful and are still in a development phases. Eg Capricorn Park and Technopark. However, the COFISA initiative has resulted in reigniting Science Park and Innovation Hub activities in the Western Cape (and other parts of the country).
- 4) Once established, these parks should play a central role in the enablement of the innovation systems itself. They represent micro-innovation environments and should aid in developing their own branding internationally and should be concerned with attracting innovative tenants expertise and young talent from all regions of South Africa and internationally. These hubs and innovation district should aim to be pockets of excellence for research, development and innovation. This will require a concerted effort and expert management and performance of the total micro-innovation system involving excellent public relations, governance and marketing.
- 5) Examples of potential future developments include: Technopark Stellenbosch, with a focus on Sustainability and Technology development. The *'Transforming Technopark'* project seeks to reinvent Technopark, Stellenbosch, which was originally designed as a Science Park. The Fringe Project, Cape Town City centre will have a focus on creativity and design<sup>5</sup>. A pre-feasibility study on the Cape Health Technology Park has successfully been completed. The aim of this park is to create a cluster of health related technology companies, operating in various sectors in the health industry value chain – hence driving competitiveness in the supply chain channels. Further potential developments include an eco-industrial design and manufacturing district for sustainable technologies in Atlantis. Furthermore, talk about a Bellville or Belcon Science Park is being pushed by CPUT.

## 8.2 A Model for the Regional Innovation System

If the total innovation system's functioning can be divided into three parts it would consist of **A**) the governance structure, **B**) the collaborative structure and **C**) the operational structure. This model is depicted and explained below. Please refer to part A on the model in Red, part B in Blue and part C in Green.

### Summary of the implication for the governance of the regional innovation system

- There are significant challenges to achieving a higher level of shared economic growth and development in the Western Cape; addressing these could be supported by an effective regional innovation system.
- There is a strong intent to support innovation collaboration embodied in innovation policy and strategy across national and provincial government; however, this has not as yet been fully integrated into wider socio-economic policy and strategy. Innovation has received less attention at a local government level to date (with the exception of the City of Cape Town where innovation has been much talked about in the last few years).
- There are pockets of effective innovation collaboration, but collaboration is not at the levels required for it to make a significant impact on economic development.
- Improving the functioning of the regional innovation system will require sustained facilitation and change management to overcome distrust and to promote new ways of working.

<sup>5</sup> These first two projects were included in the 2014 world design capital bid for Cape Town city region.

- The implementation of the Technology Innovation Agency and its regional presence will provide a key tool to support the regional innovation system – as this role emerges, the role of the Regional Innovation Forum will need to evolve.

### 8.2.1 Part A: Governance & Guidance of the Regional Innovation system

The strategic objectives of the regional innovation system cannot be determined in isolation. The term *system* implies that the various components, stakeholders and leadership structures together determine the strategic objectives for regional innovation. In reference to the model below the following structure is proposed to achieve the regional innovation systems strategic objectives as an overarching governance structure. On the one hand there is a need to understand current economic and developmental goals and trajectories. These are already spelt out at a national level (ie. New Growth Path) and provincial level (Strategic Plan) and local level (Local Economic Development Plans). This can be seen as the top-down guidelines for developing the strategic objectives, and includes a governmental understanding of priority areas and resources available, earmarked for future development and so forth. The various innovative activities of businesses, sectors, innovation environments and all the stakeholders mentioned already also need to play a bottom-up role in development of the strategic objectives. Often the innovators and business sectors know best where the strategic opportunities in terms of innovation potential lie. Therefore their voices should be heard in formulating the strategic objectives and during the policy-making process.

As can be seen in the model below, the visions of the wider innovation community are included as a central part of the strategic objectives. The reason for this is that the innovation system has to strike a fine balance between being too rigid, as it may stifle innovation processes and then again it cannot be too loose, otherwise there will be little efficiency in the system. The primary purpose of the innovation system framework structure and governance system is to allow for a flow of information and for the system itself to adapt rapidly to innovation needs. Therefore the signals given to policy makers and their reactions to the signals need to be very efficient and reliable to capitalize on innovation and development potentials. The role of the governance structure is to ensure rapid and strategic decision making processes that includes a guidance component to ensure the trajectory of innovation systems take into account the provincial goals (such as renewable energy for example). See Appendix Box 5 explaining '*Transitions to Sustainability*'.

The role of the innovation systems manager and office, as suggested in the model is key to ensuring this balance within the system. However, to ensure that the system itself is robust and long term, there is a need for continuous advice and support from a regional level innovation advisory council that selects a number of permanent and rotational members whom are either experts in their field or who are influential in decision making and leadership. These members will have the responsibility with liaising with an official policy making body within government whom can aid in shifting and directing policy extremely rapidly. The reason for this direct link and also the separation between the government sphere and the advisory council is to ensure accountability, efficiency and continuity. This does not mean that members of government cannot be a part of the advisory council, in fact they should be.

The innovation system management structure is a sub-component of the total governance structure. Broadly speaking the role of the management office would be to ensure the effective functioning of the collaboration, communication and marketing process on all levels. The manager would need to understand all aspects of the innovation system functioning, including policies the views of all stakeholders and act as a catalyst in stimulating debate about innovation potentials in the province. The manager would need to

report and brief the innovation advisory council on a continuous basis but also liaise with the government policy team. Both these structures would need to meet formally according to the system requirements to ensure effective communication. An additional role of the IS manager and office would be to monitor and evaluate the functions and performance of the various sectors and systems. This would require the assistance of research on a continual basis either through the universities, institutes such as the HSRC or through the Regional Innovation System Management office itself. Therefore, the manager would have to manage these relationships professionally as well as utilizing existing structures and channels to do so. For example the relationship between universities would require working closely with CHEC.

#### Box 4: Regional Innovation System - Smart Governance Capabilities?

Already it is possible to harness the power of ICT infrastructure to enable enhanced and more efficient flows of information. Essentially, an innovation system is about the right information being received by the right people at the right time. In essence it is a giant knowledge system and knowledge flow exercise. Therefore the costs of managing such a system will need to be compared to the benefits it is intended to create. It will also however, be about anticipating the needs of the various components through an intelligent and smart monitoring and evaluation system of information. There will be an ability for users to interact with the system on a wide scale and thus contribute to the understanding of the system through advanced computer programming and cloud computing capabilities which is already a growing innovation sector in Cape Town.

The financial and ICT sector already is working on similar technologies, and the construction of the regional innovation system online or smart governance system itself represents an opportunity for innovation. Existing initiatives such as CITI, Bandwidth Barn and Silicon Cape could potentially develop such a system as a collaborative and long term project. The benefit of which is the innovative expansion potential coming from such a required system. This is both replicable and scalable to the rest of South Africa and the developing world. For instance the mobile technology innovation in Africa is currently innovating at an extremely rapid pace, possibly due to the lack of physical hard wired telecommunications infrastructure. Integrating mobile technology applications for end users and how this can be linked to the innovation system should be explored.

### 8.2.2 Part B: The Collaborative Structure

The collaborative structure can be seen as the engine of the innovation system. It may consist of the following proposed structures to ensure the most accessible and productive functioning. This includes the **i) institutional forum platform** and, **ii) the knowledge & collaboration interface**. The rationale behind the collaborative structure is based upon the well researched understanding that innovation requires collaboration. As the COFISA (2010) reports suggest, South Africa and the Western Cape has a lack of quality informal and formal collaboration between the various stakeholder groups, especially the 3-helix network (Government-University-Academic relations). Often informal collaboration is more effective in the creation of innovation and opportunities through new ideas and business opportunity networking. It is therefore vital that such informal and formal collaboration is incentivized. It needs to be incentivized as opposed to forced or pushed as effective collaboration usually only takes part with willing participants and if there are foreseeable benefits. These benefits will need to be clearly spelt out and highlighted, and will initially require trial and error and a willingness to allow for mistakes to learn collectively.

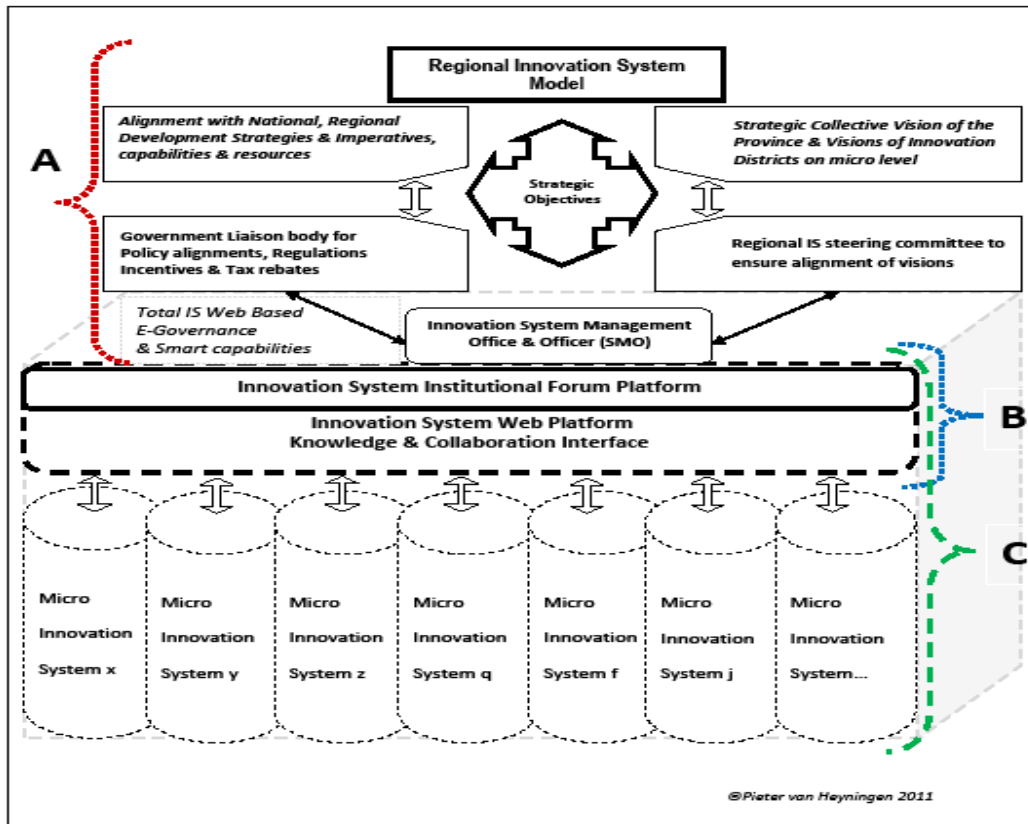
**The institutional forum structure** will require collaboration between organizations (public & private, not for profit) institutions and public structures. The incentives for collaboration here will have to be very strong and will probably also require a declared commitment from each institutional stakeholder group to form a representative body. Furthermore, the institutional forum will require leadership in the form of a permanent committee, as well as several other voluntary committees or working action groups (WAG's). Each sector may form their own forums and sub-committees. Existing and planned structures should be included into the collaborative framework as a starting point. (For example the various SPV's in the province, CHEC, and the EDA).

The real benefit of collaboration comes in where there is a cross section of innovative activity within and between various sectors or innovation clusters. This also allows for new sector opportunities and the catalyst of new innovations. Voluntary or enforced collaboration groups may be formed around various sectors or specialization groups and so forth. An example includes specialized research groups, or centers in collaboration with industry or entrepreneurs, both locally, nationally or even internationally.

The strongest incentive to keep the institutional structure (ie. Universities, CHEC, Government Agencies and Departments etc) engaged would be financial incentives in the form of collaborative project funding or access to new market opportunities. For example the Western Cape could potentially make access to African markets less challenging for global players in the clean technology industries and form international collaborative partnerships. Therefore the collaborative structure should also be vital in bringing in global expertise on various levels, and enhancing the opportunity for collaboration, technology and knowledge transfer and thus innovation through business opportunities. Although there are already programs to enhance and streamline international investments into the province, the collaborative structure will be useful to coordinate these efforts in alignment with a strategy and available resources domestically. WESGRO is an example of an existing initiative that would benefit from the collaborative structure. It will also be useful in pinning down where market opportunities exist and where collective efforts could produce novel markets for the Western Cape and South Africa. Allocating resources and stimulating debate amongst businesses as to the opportunities for export into the African market is also a massive potential for numerous innovation activities. Enhancing the innovative capacity of the Western Cape will require attracting and retaining 'cutting edge' technology and skills, domestically and internationally. Existing structures and institutions from the public and private sector would need to be able to contribute and 'buy-into' such a specialized fund only for the Western Cape and also contribute to the management of such a fund which is geared towards stimulating innovation and entrepreneurship. This may include institutions such as the DBSA, the Technology Innovation Agency and institutional support from various other institutions and governmental agencies such as the EDA. The provincial advisory council could be in the position to allocate these funds in conjunction with the funding institutions and recommend policy measures to support various initiatives. The institutional collaboration framework and platform will be the space to discuss these opportunities and develop strategies for enhancing innovation in the province.

The **knowledge and collaboration interface**, is a wider collaboration platform that should be open to the total innovation community in the Western Cape. It should also importantly include a web portal, marketing and communication strategy to ensure maximum reach and accessibility to users. The interface will be very useful for introducing and advertising specially allocated funds and initiatives from national or provincial government structures. Furthermore due to the fragmented sources of information about business

opportunities and governmental information such as tax incentives, the collaborative interface can be utilized as an informational hub and gateway. Advertising, marketing and access to university research and collaborative opportunities will also stimulate entrepreneurial activities in the province.



### 8.2.3 Part C: The Operational Structure

The operational structure is depicted by Part C, which is intended to highlight the operational space where innovative activity occurs. As shown in the diagram, Part C includes the collaborative structure, as this is the space designed for collaboration and learning to take place between various sectors. The various cylinders therefore represent 'micro-innovation systems' which are able to operate independently of the regional innovation system. The micro-systems could take the form of various sectors in the economy that are already in existence. They may also represent agglomerations of innovative activity, or niche areas or even large corporations that contribute substantially to innovation in the province. However, these micro-innovation activities may also represent future potential niche areas of planned science parks, spatial innovation or innovation districts in the province.

Whilst these independent micro-innovation systems may function very well in isolation of the rest of the system as they already do now, the purpose of Parts A and B is to provide strategic support to Part C so as to:

- Enhance innovative activity within each micro-system.
- Enhance innovative activity between each micro-system.
- Provide a support structure for collection, classification, codification redistribution of useful information and thereafter allocation of strategic resources to support innovation activities and potentials within and across each micro-system.
- Provide a direct channel to policy makers and institutional support structures.
- Ensure efficiency and contribution to the total innovation system.
- To maximize learning potentials for innovation through providing a support structure and incentive structure for collaboration.

## 9. Presenting an Outline of the proposed RIS Implementation Plan

### Steps to Establishing the Regional Innovation System for the Western Cape



## 10. Conclusion

It must be understood that the regional innovation system is already present in the province in the form of existing innovation activities. As already mentioned the innovation system is made up of various components, relationships between these components and functions of institutions to support innovative activities. Innovation activities may be economy wide, within or between sectors or taking place in various clusters, science parks or agglomerations. Although most innovation takes place within the private sector it also requires the support of knowledge institutions and government.

When we talk about building the innovation system, what is really meant is helping to enhance the current systems and components that lead to innovation and hence economic growth and sustainability. Therefore building the innovation system means building capacity to govern relationships, collaborative efforts and strategic resources. This also means guiding policy and incentives as well as investments into new research to develop certain innovation processes or technologies. Building the innovation system means understanding the weaknesses and opportunities in the system. Slowly building up skills within a certain area to meet a capacity to utilize a new technology in the future requires expert understanding of market opportunities and foresight. Therefore well functioning innovation system managers need to have a vast understanding of numerous aspects of the economy, so as to advise policy makers of the best way in which to focus their limited resources. Innovation at the end of the day is not only about being more competitive, but also about finding new ways to grow the economy and include poor people into the formal economy as well as develop more environmentally friendly technologies, products and processes (which leads to greater employment).

Innovation systems for sustainability will require a strategic focus on all these developmental aspects which in turn may become the strategic economic advantage of a country like South Africa and a province being the Western Cape. Economic growth of the future in South Africa will require innovation that is uniquely South African for Africa and the developing world and need not only be innovation to compete with the rest of the world. This will require strategic leadership at the highest level to ensure a growth path and innovation trajectory that will bring the Western Cape to a position of economic liberation, stability and uniqueness.



## Bibliography

Castells, M. 2000. *The Information Age: Economy, Society and Culture*. 2nd Ed. Blackwell Publishing: Oxford.

COFISA 2007. *Establishing Science Park Activity in the Eastern and Western Cape Provinces*. COFISA & Department of Science and Technology.

COFISA 2009. *Mapping Triple-Helix Innovation Networks in the Western Cape*. Kaiser and Associates, Commissioned by COFISA and Department of Science and Technology.

COFISA 2010. *Enhancing Innovation in South Africa: The COFISA experience*. Dept. of Science & Technology: Pretoria.

Freeman, C. 1998. *Innovation Systems: City-state, National, Continental and sub-national*. Federal Institute of Economics: Rio De Janeiro.

Geels, F. & Schot, J. 2007. Typology of socio-technical transition Pathways. *Research Policy* 36 (2007) 399-417.

HSRC 2009. Blankley, W. & Moses, C. (Eds). *Main results of the South African Innovation Survey 2005*. HSRC Press: Cape Town.

Loorbach, D. & Rotmans, J. 2010. The practice of Transition Management: Examples and Lessons from four distinct cases. *Futures* 42 (2010) 237-246.

Lundvall, B-Å., Joseph, K.J., Chaminade, C., & Vang, J. (Eds) 2009. *Handbook of Innovation Systems and Developing Countries: Building Domestic Capabilities in a Global Setting*. Edward Elgar: Cheltenham.

Lundvall, B-Å & Borrás, S. 1997. *The globalizing learning economy: Implications for innovation policy*. Luxembourg: European Communities.

Lundvall, B-Å 2007. *National Innovation System: Analytical focusing device and policy learning tool*. Swedish Institute for Growth Policy Studies: Ostersund.

McKinsey (MGI) 2010. (Edt) Roxborough, C., Dorr, N., Leke, A., Tazi-Riffi, A., van Wamelen, A., Lund, S., Chironga, M., Alatovik, T., Atkins, C., Terfous, N. & Zeino-Mahmalat, T. *Lions on the Move: The progress and Potential of African Economies*. McKinsey Global Institute.

Montalvo, C., 2008. *Sustainable Systems of Innovation*. Globelics: Mexico.

OECD 2010. *OECD, Science and Technology Industry Outlook*. OECD Publishing

OECD 1997. *National Systems of Innovation*. OECD Publications: France.

OECD 2005. *Oslo Manual, 3rd Edition*. OECD Publishing: France.

Stamm, A., Dantas, E., Fischer, D., Ganguly, S., Rennkamp, B. 2009. *Sustainability Oriented Innovation Systems: Toward Decoupling Economic Growth from Environmental Pressures?* DIE: Bonn.

Strategic Plan of the Western Cape 2010 [Draft]. Provincial Government of the Western Cape. Department of the Premier.

Winkler, H. & Marquand, A. 2009. *Changing Development Paths: From an energy-intensive to low-carbon economy in South Africa*. *Climate and Development* 1 (2009) 47-65.

## Online Sources

HSRC 2007. HSRC Innovation Study Review. Sourced online at: <[http://www.hsrc.ac.za/HSRC\\_Review\\_Article-55.phtml](http://www.hsrc.ac.za/HSRC_Review_Article-55.phtml)>

## Appendix

### Box 1: A Summary example of a Local Economic Development (LED) strategy: Mossel Bay Municipality

Local Economic Development (LED) is a key component of the deliverables of Municipalities. It is imperative that every municipality in South Africa creates an environment that is conducive to economic development, attract investors and stimulates growth. The primary objective of developing this LED strategy is to create a conducive environment for all the relevant stakeholders to pool resources and expertise in order to create a significant number of decent sustainable job opportunities in all the economic sectors. This constitutional responsibility has become even more urgent in the current climate of the global economic downturn, which has already sunken its teeth in our local economy and resulted in major job losses in various sectors. Section 152 (1) c, of the Constitution Act 108 of 1996, states that one of the objects of local government is to promote social and economic development. Expanding on the developmental duties of municipalities, Section 153 goes on to state: *"A municipality must: a. structure and manage its administration, budgeting and planning processes, to give priority to the basic needs of the community and to promote the social and economic development of the community; and b. participate in national and provincial development programmes."*

These objectives are further articulated in the Municipal Systems Act 32 of 2000. The stated priority function of this Act is: *"To provide for the core principles, mechanisms and processes that are necessary to move progressively towards the social and economic upliftment of local communities..." and more so "to progressively build local government into an efficient, frontline development agency capable of integrating the activities of all spheres of government for the overall social and economic upliftment of communities"...* This has also brought about a more strategic focus on ensuring job retention versus the creation of new jobs. Our strategy should also illustrate how this municipality is going to contribute towards the national job creation target of 500 000 job opportunities as well as the economic growth target of 6%. A core component of human development is to empower the local community to participate in the local economy in order to take charge of their own destiny and lessen the dependency on the social safety net provided by government and the relevant strategic partners. This is essentially the objective of an LED strategy with a pro-poor focus but also to strengthen the existing businesses. Skills development in the municipality is lacking far behind as had been indicated in the Integrated Development Plan (IDP) of Mossel Bay Municipality and subsequent to this strategy it is essential that all the relevant stakeholders embark upon a comprehensive skills development programme. The skills development programme should essentially be directed to address the skills shortages identified in the major economic sectors to ensure a market driven approach and to ensure the successful implementation of the LED Strategy.

The roll out of this strategy should also be done in a sustainable manner, meaning that the resources in the Greater Mossel Bay area should be optimally utilised as a catalyst for economic growth but not to the detriment of the environment. We should strike a balance to ensure that our future generation should also be in a position to utilise similar resources to address their socio-economic needs. Mossel Bay also has some fishing communities who are currently bearing the brunt of reduced fishing quotas and diminishing marine resources which is seriously compromising their livelihoods. This strategy will also propose alternative development proposals for those communities.

Our strategy should also illustrate how this municipality is going to contribute towards the national job creation target of 500 000 job opportunities as well as the economic growth target of 6%.

We need not only to think out of the box, but also how to manufacture the box to be used in different ways.

**Source:** Mossel Bay Local Economic Development Strategy 2011.

### Box 2: List of individuals, Interim Steering Committee & 'Informal' texts & presentations consulted

Many of the following persons were instrumental in setting up and initializing the Regional Innovation System within the province, and were a part of the 'Interim Steering Committee', which is also listed below. However, not all of the individuals that were consulted are a part of steering committee. These individuals were selected due to their rapid availability and close involvement with the project and knew the history of setting up the innovation system well. Those indicated with a \* behind their name are a part of, or where involved in this steering committee previously. Below is a list of consulted individuals and interviewees in no specific order:

Rahima Loghdey (DEDAT)\*

Nigel Gwynne-Evans (DEDAT)\*

Jo-Ann Johnson (DEDAT)\*

<i>Naim Rasool (TIA)*</i>
<i>Daniel Theron (TIA) *</i>
<i>Rizwana Mia (TIA)*</i>
<i>Craig (TIA)</i>
<i>Sobelo (TIA)</i>
<i>Johann Strauss (DST)*</i>
<i>Green Cape members</i>
<i>Saberi Marais (InnovUS)</i>
<i>Cape Tooling Initiative, CEO</i>
<i>Anton Groenewald (Office of the Premier)</i>
<i>Andrew Borain (CEO, Cape Town Partnerships/ EDA Project Co-ordinator)</i>
<i>Yehuda Raff (Cape Town Partnerships/ Fringe Project Co-ordinator)</i>
<i>Guy Lundy (Accelerate Cape Town)</i>
<i>Saliem Fakhir (WWF)</i>
<i>Sunspace Employee</i>
<i>South African National Innovation Advisory Council (SANCI)</i>

Below is the official list of the 'interim steering committee' for setting up the regional innovation system of the Western Cape:

<b>NAME &amp; SURNAME</b>	<b>ORGANISATION</b>	<b>EMAIL ADDRESS</b>
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The following is an example list of literature and studies that are not formally cited in the strategy. This was due to their status as 'drafts' or work in progress. However, their importance in formulating the most 'current' strategy required their perusal and thus inclusion in one form or another. Out of respect for the author's, it must be noted that none of the documents were referred to directly within the text as they are mostly 'in progress reports'. Only the Western Cape Draft plan and the City Economic Development Strategy, Cape Catalyst and Economic Development Agency reports were mentioned. At the time of publication of this report, the facts or final documents may contain different information.

- **Western Cape Regional Innovation Strategy** [Previous Draft Document] June, 2011
- **The City of Cape Town: Economic Development Strategy** [Draft] July, 2011
- **The Draft Strategic Plan for the Western Cape Province 2010** (Dept. of the Premier)
- **CT Competitiveness Studies:**
  - a) Renewable Energy Sector Report, July 2010.
  - b) Strategy for Regional Entrepreneurship
  - c) Strategy for Developing a city-wide Green Economy
- Martin Nicol, ODA, CHEC Interview notes.
- 
- Lorentzen, J., Manamela, A., Muller, L. & Gastrow, M. 2010. (DRAFT) **A TECHNOLOGY GAP ANALYSIS OF LEADING FIRMS IN CAPE TOWN: Background paper for the study on Cape Town's future competitiveness and the global knowledge economy.**
- Lorentzen, J., Manamela, A., Muller, L. & Gastrow, M. 2010. (DRAFT) **THE ROLE OF MULTI-NATIONAL ENTERPRISES (MNE'S) IN CAPE TOWN'S COMPETITIVENESS.**
- Van Niekerk, A., Donaldson, R., du Plessis, C. & Spocter, M. 2010. (Discussion Draft) **A revision of 2004 Growth Potential of Towns in the Western Cape study.** Environmental Affairs & Development Planning. University of Stellenbosch & CSIR.

### Box 3: List of Relevant Policy for Regional Innovation System

#### Innovation policy and strategy:

- The Department of Science and Technology (DST) White Paper on Science and Technology (1996)
- The National Research and Development Strategy (NRDS)
- The DST Ten Year Plan (2007)
- The Medium Term Strategic Framework (MTSF) 2009-2014
- The DST draft Regional Innovation Systems Strategy

#### Wider socio-economic policy and strategy:

- National Industrial Policy and Action Plan (NIPF, IPAP)
- Western Cape Provincial Growth and Development Strategy (PGDS)
- Western Cape Microeconomic Development Strategy (MEDS)
- Provincial 2000 'White Paper on Preparing the Western Cape for the Knowledge Economy of the 21<sup>st</sup> Century'
- Local government Integrated Development Plans (IDP) and Local Economic Development (LED) strategies

## Explanation of Policy and Importance for the Regional Innovation System Framework

The draft Regional Innovation System strategy, as understood from the DST mandate, **foresees the roles and responsibilities of Regional Innovation Forums** as to:

- Promote innovation within a defined region within the province.
- Initiate the management and leveraging of funding for provincial innovation surveys.
- Act as a community of practice for the Activator Programme – intermediary that stimulates collaborative projects that ultimately result in creating sustainable opportunities for high-tech Small business development and job creation
- Provide provincial representation on the National Innovation Working Group
- Interact with the Provincial Innovation Councils on issues relating to the Regional Innovation System
- Provide networking opportunities for small and medium enterprises to participate meaningfully in the emerging knowledge and information driven global economy.

It also specifies the following roles for a Provincial Innovation Council:

- The PIC will provide strategic advice to the Premier and the provincial executive council, and allow the provincial economy to move along a knowledge economy trajectory.
- The main functions of a PIC will be to:
  - Guide and regulate how provincial government departments should interact with Regional Innovation Forums.
  - Provide funding, through the provincial treasury, for the activities of the Regional Innovation Forums activities.
  - Guide provincial government departments on the use of information and communication technology to increase service delivery to the public and triple helix stakeholders.
  - Recommend measures to eliminate the digital divide between the urban and rural communities.

The Technology and Innovation Act allows for the establishment of a **Technology Innovation Agency (TIA)**. The TIA's main function is to deliver socio-economic value through technological innovation across sectors of the economy by means of the following:

- Appropriately structured financial and non-financial interventions able to respond to the needs of the different stages of the innovation value chain
- Development and maintenance of human capacity for innovation
- Building a culture of innovation
- Leveraging local and international partnerships
- Having regional offices that would render services to regions

The **National Industrial Policy Framework** targets the following impact on the economy:

- Long term industrialisation
- Diversification beyond traditional commodities
- Increased value addition in tradable goods and services
- Promotion of labour absorbing economic development
- Industrialisation that ensures increased participation (BBBEE) and marginalised regions
- Contribution to building industrial development on African continent

The recent revision of the **Industrial Policy Action Plan (IPAP)** has identified a range of efforts to increase the impact of South Africa's industrial policy in order to address low growth rates, inequalities, unacceptably high unemployment levels and overall economic performance that is not keeping pace with comparator countries. Therefore the latest action plan identifies the following economic objectives<sup>6</sup>:

- Rural development through activities such as agro-processing, bio-fuels, forestry, cultural industries, aquaculture, tourism
- Advanced technological capabilities such as nuclear, advanced materials, aerospace, ICT
- Imperatives and opportunities in the "green economy"
- Downstream mineral beneficiation
- Strengthened linkages between tourism and cultural industries
- **Stronger integration between sector strategies, skills development and innovation activities**
- Macro-economic stability
- Significant contribution to employment, both direct and indirect

The Provincial Government of the Western Cape has identified "knowledge intensity" (i.e. economic activity that gains its competitive

<sup>6</sup> Presentation by Minister Rob Davies to Parliamentary Portfolio Committee, 23 February 2010

advantage from knowledge and skill rather than, for example, from raw materials or cheap labour) as a key part of the growth strategy for the province, and has stated an intention to develop an innovation framework in partnership with business and universities.

**Provincial government's economic sector priorities** include the following (as stated in the **Micro Economic Development Strategy**):

- "Priority" sectors: oil and gas supply industry, Information and Communication Technology, Business Process Outsourcing (BPO), tourism
- "Significant" sectors: creative industries, film, craft, music, clothing & textiles, metals & engineering, agri-processing & food-processing, boat-building
- "Watch-list" sectors: Fishing & aquaculture, biotechnology, chemicals, printing & packaging, financial services, retail, wholesale & franchising, environmental goods & services, electronics

As part of the MEDS strategy rollout, provincial government has funded a number of sectoral Special Purpose Vehicles which have been formed in partnership with industry. However, this has now changed with the implementation of the EDA process.

The 2005 **Provincial Advanced Manufacturing Technology Strategy** identified craft, electronics, food, metals and engineering (including tooling), and clothing as initial focus sectors, with further sectors to be identified over time. Recommendations for **collaborative innovation across these sectors** included the establishment of a craft centre for innovation, an electronics innovation network and a food innovation network. Four technology focus areas were also identified, namely: advanced materials, advanced product technologies, advanced production technologies, and logistics.

**Local governments** have, with some exceptions, given innovation systems limited focus within their Integrated Development Plans and Local Economic Development strategies. However, these plans and strategies do identify socio-economic challenges and a range of infrastructural, service, sectoral and small business support initiatives to address these challenges – many of these may benefit from the contribution of innovation.

**Source:** Draft Regional Innovation Strategy, March 2010.

#### Box 4: Accepted OECD Definitions for Innovation Systems

A national system of innovation has been defined as follows:

- "... the network of institutions in the public and private sectors whose activities and interactions initiate, import, modify and diffuse new technologies." (Freeman, 1987)
- "... the elements and relationships which interact in the production, diffusion and use of new, and economically useful, knowledge ... and are either located within or rooted inside the borders of a nation state." (Lundvall, 1992)
- "... a set of institutions whose interactions determine the innovative performance ... of national firms." (Nelson, 1993)
- "... the national institutions, their incentive structures and their competencies, that determine the rate and direction of technological learning (or the volume and composition of change generating activities) in a country." (Patel and Pavitt, 1994)
- "... that set of distinct institutions which jointly and individually contribute to the development and diffusion of new technologies and which provides the framework within which governments form and implement policies to influence the innovation process. As such it is a system of interconnected institutions to create, store and transfer the knowledge, skills and artefacts which define new technologies." (Metcalf, 1995)

**Source:** Cited in OECD 1997

#### Box 5: Sustainability Transitions and how it is implemented within Dutch policy

##### What exactly is transition management?

Transition management is a new steering concept that relies on 'darwinistic' processes of variation and selection. It makes use of "bottom-up" developments and long-term goals both at the national and local level. Learning and institutional change are key elements which means that transition management is not so much concerned with specific outcomes but rather with mechanisms for change. The basic philosophy is that of *goal-oriented modulation*: the utilisation of ongoing developments for societal goals. An important question therefore is: what do people really want, both as users and citizens?

The concept is situated between two different views of governance: the incremental 'learning by doing' approach and the blueprint planning approach. Transition management is a form of multi-level governance with the following activities:

- **Strategic level:** visioning, strategic discussions, long-term goal formulation.
- **Tactical level:** processes of agenda-building, negotiating, networking, coalition building.

➤ **Operational level:** processes of experimenting, implementation.

Policy choices are made “along the way” on the basis of learning experiences at different levels. Different trajectories are explored and flexibility is maintained, which is exactly what a manager would do when faced with great uncertainty and complexity: instead of defining end states for development he sets out in a certain direction and is careful to avoid premature choices.

**Circular elements of transition management**

Transition management does not consist of a step plan but uses certain broad heuristics.

Key elements of the transition management cycle are: anticipation, learning and adaptation. The starting point is the structuring of problems – to achieve a common outlook. This is followed by the development of long-term visions and goals. Goals are being set via the political process and deliberations in transition arenas. The government acts as a process manager, dealing with issues of collective orientation and adaptation of policy. It also has a responsibility for the undertaking of strategic experiments and programmes for system innovation. Control policies are part of transition management. For sustainability transitions, overall frame conditions must reflect environmental costs – prices should “speak” the environmental truth. This is something for government and politics.

Transition management aims for generating “momentum” for sustainability transitions. Not all companies will contribute to a transition, but once a new development takes shape, others will follow suit, including companies invested in the old system. This is already happening in the area of energy where oil companies are moving into the business of renewables. When this happens the change process becomes a force of its own. This is a critical phase in a transition in which also unwanted path dependencies occur. Society has to develop antennas (via ‘assessment tools’) for systemic effects. Transition management requires continuous anticipation and adaptation.

**Policy integration**

The integration of various policy areas is part of transition management. Areas for integration are: science policy, fiscal policy, innovation policy and regulation (both national and international). This is an important but difficult task. The use of transition agendas and transition arenas should help to achieve this. Policy integration is probably aided by a more reflexive approach of policy making in which learning is institutionalised.

**What makes transition management different?**

Transition management does not rely on blueprints but relies on iterative decision making in which also goals may change. Decisions are made on the basis of experiences and new insights. Policy choices would be more based on long-term desirability instead of on short-term solutions. Long-term possibilities are given support but still need to prove themselves to society. This way, society may discover what is best.

Through transition management space is being created for change. The space should not be too narrow, lest society will get locked into suboptimal solutions. To prevent this from happening, transition management opts for a portfolio approach and ‘evolutionary’ steering.

**Transition policy for sustainable energy**

The Dutch government is committed to achieving a transition to sustainable energy. The transition is oriented towards the following goals: (1) secure and reliable services, (2) low prices and (3) minimal ecological damage and minimal negative impacts on society. The goals were set following a stakeholder consultation process.

Out of the different routes to meet these goals, 5 main routes were chosen, based on an assessment of the strengths of Dutch knowledge clusters and environmental priorities. The routes are: green gas, chain efficiency, bio-based resources, alternative motor fuels, and sustainable electricity supply. It is believed that especially micro co-generation, biomass and off-shore wind energy offer chances for Dutch business. For transition experiments for sustainable energy, 35 million euro is available, a large sum of money. The experiments should learn not just about technical issues but also about acceptance, user needs and markets.

Policy renewal is officially part of transition policy. The Dutch government is committed to better policies and to partnership. One thing it hopes to achieve through a more open, interactive approach is a better coordination of different policies (environmental policy integration).

**Source:** Kemp, R. (online) Visit: <http://kemp.unu-merit.nl/docs/Transition%20management%20for%20SD3.doc>.



### Box 6: Short background description and timeline for initializing the RIS, regional WC process to date

- 1: COFISA/DST Recommendations to set up Provincial Innovation Systems & Forum's [2009].
- 2: COFISA 3-Helix report for the Western Cape [2009].
- 3: DST/DEDAT/TIA initiated regional interim steering committee [2009].
- 4: Kaiser & Associates commissioned to develop RIS working document.
- 5: Document was commented upon by steering committee, which suggested reworking the document.
- 6 a: DEDAT/TIA/DST took lead in 'reworking document' and pushing process forward.
- 6 b: Series of RIS interim steering committee meetings during initiating period discussed the following points:
  - i. 20<sup>th</sup> August 2010 (*TIA involvement/ Sector Focus SPV's/ Role of Innovation in Province*)
  - ii. 24<sup>th</sup> August 2010 (*DEDAT/CHEC meeting/ Innovation Study*)
  - iii. 31<sup>st</sup> August 2010 (*RIS Strategy discussion, concerns and 'way forward'*)
  - iv. 2<sup>nd</sup> December 2010 (*Provincial Innovation Committee / Stakeholder Roles/ Ownership of RIS/ Management*)
  - v. 11<sup>th</sup> February 2011 (*Plan of Action 2011-2012/ RIF steercom. Nominations/ leadership/ representivity in com.*)
  - vi. 21<sup>st</sup> February 2011 (*Discussion about future RIF roles\_T.O.R. / Appointment of project manager 3 years*)
  - vii. 14<sup>th</sup> April 2011 (*RIF Nominations & Roles continued/ Project manager funded by DST/TIA/DEDAT*)
  - viii. 19<sup>th</sup> May 2011 (*Appointment of 'interim' project manager from TIA/ DST steercom nominations criteria*)
  - ix. 29<sup>th</sup> June 2011 (*Aims to 'institutionalize' innovation in province/ TIA play in-between role/ Secretariat\_CHEC*)
- 7: 29<sup>th</sup> June 2011 Action Plan main points:
  - i. *Finalize RIS Framework Document/ Finalize inputs.*
  - ii. *Presentation to SPV forum 18<sup>th</sup> August.*
  - iii. *Finalization of decision for CHEC housing the secretariat for the RIS.*
- 8: During action phase i. above, the involvement of a final year PhD student, who had been engaging with a member of the 'interim steering committee', was asked to make comments on the interim framework. It was agreed due to his work and research focusing specifically on the regional innovation system of the Western Cape region, and Stellenbosch on a micro level.
- 9: After commentary was received by TIA project manager and DST/ DEDAT, the PhD student was invited to discuss with some of the interim steering committee members. It was agreed that his theoretical knowledge and inputs would be useful to the process.
- 10: After further involvement, it was agreed that the PhD student assist the TIA interim project manager and DEDAT to finalize the document within a 1 month period of study and a 1 month period of writing the document.
- 11: This document represents this effort, which is a compilation of numerous processes and decisions happening previously.

#### Short Description of process followed in compiling this document:

- A:** Meetings/ Consultation/ Interviews with 'key stakeholders' in past and future innovation processes & projects (List in Box 2, above).
- B:** Review of all meetings, minutes, previous studies documents and presentations relevant of setting up the RIS.
- C:** Integration of key aspects of previous draft RIS framework document.
- D:** Compilation/ feedback/ agreement on RIS governance model (Included in this document, pg. 26).  
 - This included providing a theoretical knowledge framework and the latest thinking about innovation systems. This brought in a sustainability element which is quite distinct from the previous framework document.
- E:** Budget Items & Management Structure (Working progress in consultation with RIS steering committee).
- F: Review & Rework [Please note this is a working document, and new information may be fed into the document periodically]**

### Box 7: Sectoral Innovation Strengths for the Regional Innovation System

Sectors	MEDS sectors	Sectors with SPVs	Large contributors to provincial economy	Areas of provincial specialisation relative to SA economy	Areas with apparent high innovation	Cofisa study: potential common triple helix strengths and interest
Oil and gas services	Priority	X				
Information and	Priority	X	X		X	X



Communication Technology						
Business Process Outsourcing	Priority	X				
Tourism	Priority	X	X			
Creative industries – film, craft, music	Significant	X			X	X
Clothing & textiles	Significant	X		X		
Metals & engineering	Significant	X (tooling)		X	X	
Agri-processing & food-processing	Significant			X	X	X
Boat-building Ship repair	Significant	X			X	X
Fishing & aquaculture	Watch-list					
Biotechnology	Watch-list	X				X
Chemicals	Watch-list					X
Printing and packaging	Watch-list			X		
Financial services	Watch-list		X			
Retail, wholesale & franchising	Watch-list		X			
Environmental goods & services,	Watch-list					
Electronics	Watch-list					
Transport			X			
Furniture				X	X	
Renewable energy					X	X
Medical equipment					X	X
Pharmaceuticals and drug discovery					X	X
Consumer goods serving low income/base of the pyramid markets						X

**Source:** Draft Regional Innovation Strategy, March 2010.