



INDUSTRIAL POLICY ACTION PLAN

Economic sectors, employment and infrastructure development cluster

2018/19 - 2020/21

Economic Analysis

10-year Legacy Review

Key Constraints on Industrial Policy

Transversal and Sector Focus Areas with Key Action Programmes



the dti


Department:
Trade and Industry
REPUBLIC OF SOUTH AFRICA

towards full-scale **industrialisation** and inclusive **growth**

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FOREWORD BY THE MINISTER OF TRADE AND INDUSTRY



Dr Rob Davies MP

This is the tenth annual iteration of the Industrial Policy Action Plan (IPAP) and the last of the present administration. In addition to providing an economic analysis of prevailing global and domestic economic conditions relevant to industrial policy; time bound action plans and programmes across a range of sectors and listing the key constraints to an optimal industrial strategy, IPAP 2018 provides a summarised Legacy Report covering progress over the ten years of its existence.

The occasion also gives us a useful opportunity to reflect on the implementation of IPAP in the period since the adoption of the National Industrial Policy Framework (NIPF) and the experience of implementing successive, updated Action Plans over the course of one decade.

Industrial policy has the over-arching objective of enhancing the productive capabilities of the economy. In other words, industrial policy aims to increase the economy's ability to produce more and more complex and high value-added products with greater efficiency. In simple terms, this means to produce more value using less resources. Building the economy's industrial capabilities is a continuous and long-term endeavour and technologies continuously evolve.

The key challenge to industrial policy is to incentivise investment in plant, technologies and skills that would have medium to long term benefits to the economy, but which the market would screen out because there is lower hanging fruit for short term returns. Industrial investment in targeted technologies and sectors spills over to the rest of the economy, resulting in generalised productivity improvement and increased welfare.

Industrial policy has traditionally placed a strong emphasis on the manufacturing sector, precisely because of such spill-over effects, and in terms of production disciplines, the mastery of new technologies and ultimately design capabilities. However, the boundary between what were historically considered primary sectors, such as mining and agriculture, and manufacturing industries and the services sectors, is becoming increasingly blurred.

For example, the process of producing high-value agricultural produce on large scale for exports has become extremely technologically complex; more so than some manufacturing processes. Similarly, the mechanisation and digitisation of deep-level and above-ground mining processes require the mastery of complex industrial capabilities, including many technologies and disciplines associated with the digital industrial revolution. In a nutshell, many primary sectors have become industrialised, and with time this will become even more the case.

In addition, core to South Africa's industrial policy is the objective of transforming the racially skewed ownership, management and employment profile of the economy. The synergies between industrial policy and transformation are obvious. If a product is imported, there is no possibility of building a transformed supply chain. Industrial policy needs to make a concerted effort to ensure that support for investment is integrated with support for transformation. For example, the Black Industrialist Programme provides significant grant finance for investment in new plant, provided that the enterprise has at least a 50% black shareholding and/or exercises control over the business.¹

In addition, then, to these matters of context, the following observations are critical, in our view, to the future of a successful domestic industrial strategy.

Basic economic service delivery

Firstly, basic economic service delivery needs to be in place for there to be effective industrial policy: As is now very widely accepted, the institutional failure that derives from pervasive corruption and rent-seeking in key SOCs must be rooted out from top to bottom.

1. Other criteria:

- Provides strategic and operational leadership to the business;
- Is entrepreneurial and takes personal risk in the business;
- Does business in manufacturing and related sectors, with particular reference to IPAP and IDC focus areas;
- Makes a long-term commitment to the business and is not a short- to medium-term investor.

On the supply side, SOCs must play a key enabling role in support of the general economic and industrial effort by providing competitive and efficient electricity, rail and port logistics. On the demand side, they must support localisation, supplier development and black economic empowerment. Urgent attention must be given to the institutional renewal of public-sector monopolies which have been responsible for significant import leakages, debilitating and unsustainable increases in electricity, rail and port costs and attendant inefficiencies.

Institutional coordination

The realities of institutional coordination need to be carefully considered. Industrial policy rests on multiple foundations and must embrace a complex set of interlocking and mutually supportive policies and programmes, held together by the vision set out in the National Development Plan.

On the one hand, industrial policy must be a policy of *the whole of government* and not just one or two departments. Policy coherence and programme alignment are a precondition for successful industrial interventions.

On the other hand, the reality is that building institutional capability and coherence is a slow, hard job, particularly given the unevenness of existing capabilities across the South African state.

This being so, the only practical way to implement effective industrial policy is to 'learn by doing.' An optimal industrial effort requires carefully designed and calibrated policy, against the background of increasingly uncertain, volatile – and often potentially hostile - global market conditions. This effort must, of necessity, address both the structural fault-lines and the evolving dynamics of the domestic political economy; and it must encompass development- and investment-friendly 'smart' regulation.

In the absence of policy certainty, fragmentation in government, wilful non-compliance and corruption in private and public-sector institutions - all these and more - inevitably lead to sub-optimal outcomes.

Industrial policy in the global context

The global context remains critical. The past decade of implementing South African industrial strategy needs to be understood in relation to the global financial crisis of 2008-2009 and the extended economic crisis which flowed in its wake. The ensuing slump in global demand for many of South Africa commodities resulted in a slowing down of exports and investment in South Africa. In addition, surplus global capacity in the production of many key commodities has created huge challenges for South African industry.

For example, in the steel sector an inter-governmental task team was formed to deal with a crisis in the industry, through the judicious deployment of a range of industrial policy measures. While internationally recognised as a model of government-industry-labour social dialogue, it was essentially a holding action. Much more still needs to be done to ensure that SA's domestic steel production is globally competitive and supports an increasingly globally competitive, value-adding, technology-intensive downstream sector.

Industrial Policy is by its nature an iterative process: the building of industrial capabilities is a step-by-step process. It is not possible for an economy to master highly advanced and complex industrial capabilities, if basic and intermediate capabilities are not in place. This means that policies need to continually adapt to developments in every industrial sector.

The key to industrial policy is thus how effectively it can adapt to a very dynamic environment. In the case of the automotive industry, for example, SA has made enormous progress in establishing a globally competitive, export-rich automotive sector. But the global market requires constant innovation and creativity, and so our efforts in the sector cannot stand still.

Consequently, the past year has seen the development, in collaboration with the automotive industry, of a 2020 Automotive Masterplan to drive the development of supplier industries to the Original Equipment Manufacturers' assembly plants and secure greater levels of black economic empowerment. These will be the preconditions for ongoing public-sector support to the industry.

Partnership with the private sector

Industrial policy is ultimately about promoting investment by the private sector in new industrial capabilities.

One of the key principles that government is drawing on is to form conditional collaborative partnerships with private sector companies that show substantial commitment to invest in areas that are aligned with policy objectives.

For example, work in the mining sector has given rise to a comprehensive research and development programme, in partnership with key players in the underground mining sector. This will develop a new suite of technologies capable of mining at below four kilometres underground; but it will also focus on localising the design and manufacture of these technologies in South Africa, at the same time as putting in place measures to ensure that displaced workers are re-employed elsewhere.

The Realities of Beneficiation

From a beneficiation point of view, the comparative advantage of mining product in South Africa is ultimately determined by the logistical costs of getting the product to a beneficiation centre. For example, the cost of logistics for precious metals is extremely low compared to the value of the metal itself; whereas for iron ore the logistics costs are much more significant.

Of course, as happened in South Africa through the practice of import parity pricing in steel and chemicals, our comparative advantage at a primary commodity level can be completely negated through monopolistic practices by processing companies. Furthermore, the key drivers of country competitiveness in the beneficiation of any product relate to technology mastery, skills and the investment in plant and enabling infrastructure. Hence, to realistically assess the comparative advantage of beneficiating minerals in South Africa requires an analysis of location advantage as well as the quality of the beneficiation cluster.

One such opportunity for beneficiation stands out for the coming period. South Africa is by far and away the dominant producer of Platinum Group Metals in the world. The PGM mining industry has the challenge of securing future demand for the metal as electric vehicles replace the need for catalytic converters.

Mining companies in particular have a strong interest in the building of industries that use new platinum applications. Consequently, the mining industry, through deploying key **dti** incentives, is playing a leading role in the development of new applications and markets for fuel cells in South Africa.

On the back of several years of collaborative work and effort, we are pleased that mineral-based energy solutions like fuel cells and energy storage are gaining momentum, with a number of key projects already being implemented by government, the IDC and the industry. These hold out very significant opportunities for South Africa. For example, the use of non-petroleum fuels is driven by the global response to climate change and greenhouse gas commitments, with strong indications that fuel cells will be the future - especially for long-distance and heavy vehicle transport.

In addition, fuel cell mining equipment offers important health and safety benefits compared to diesel and electric options in underground mining applications.

Ongoing fuel cell projects include development of bus, forklift and mining equipment prototypes, stationary combined heat and power applications and rural electrification projects. Localisation discussions are under way with fuel cell OEMs in co-operation with the Department of Science and Technology's HySA initiative.

SA's usable mineral endowment extends beyond platinum. Vanadium, manganese and nickel are sought-after metals in the battery materials market. Given SA's good resources of these minerals, key projects include vanadium electrolyte manufacturing, manganese precursor development and pure nickel sulphate production.

The need for firm-level interventions

At times industrial policy needs to drive focused firm-level interventions. For example, a key requirement of the labour-intensive clothing sector is the need to be able to rapidly respond to the retail demand for world class manufacturing principles including new designs and fast fashions, quick turn-around times and so forth.

The Legacy Report demonstrates that the implementation of our Clothing Textile, Leather and Footwear policy has resulted in significant gains across a range of economic indicators in the sector, essentially saving a sector from the harsh winds of liberalisation.

As is the case in the automotive sector, **the dti** - working in partnership with leading clothing retailers, textile and clothing companies and labour - is supporting a process of policy upgrading to provide further, more nuanced support for the sector across the entire value chain.

This includes working with SA retailers, who are faced with fierce competition arising from the entry into the domestic market of global retailers and the global supply chains that support them.

The need for a much stronger export effort

SA's basket of value-added exports is small and its exports are overwhelmingly commodity-intensive. It is imperative that a greater export effort supports existing lead and dynamic exporters as well as new, especially black owned entrants. SA has historically suffered from the fact that its export markets are 'deep water' destinations. Notwithstanding infrastructure and other challenges, the African continent and sub-region represents an enormous opportunity for the domestic economy. An investment-led trade and regional industrial integration approach to our trade, investment and export effort on the African continent signals SA's intention to fully support the industrialisation of the continent and to break the shackles of resource dependency in the region.

The Legacy Record

It is against this background that IPAP 2018 offers a retrospective legacy record for the 10-year period to date. This does not pretend to be exhaustive. It would be impossible to recount all the ground-level detail of what has been achieved over the decade. Instead, what is presented is a high-level themed report that picks out the major features of policy intervention and the transversal and sector-specific programmes outcomes that have followed from them. It also demonstrates as clearly as possible what has worked and why.

This has been done to demonstrate that there have been significant achievements in key spill-over industrial sectors. These have succeeded in containing the process of deindustrialisation that has so negatively impacted many peer developing countries. These achievements have also demonstrated the potential that exists for success in opening up new sectors such as renewables.

Radical economic transformation

Finally, this last iteration of the IPAP for this term of government demands a reflection on what is required to overcome the critical constraints that have undermined ten years of implementation and must be overcome to secure an industrialisation programme to the required scale in the years ahead.

Defined as radical economic transformation, the key thrust of this economic reorientation is to start tackling the long-standing structural fault-lines in the economy head-on – systematically eliminating race-based economic ownership and control and finding effective instruments to attack South Africa's catastrophic problems of unemployment, poverty and inequality - which not only constitute a scourge on society but also act as a critical barrier to growth.

A very important aspect of these problems is the gendered nature of disadvantage in South Africa. The representation of women in management and in the workplace, across all sectors of the economy, including manufacturing, remains unacceptably skewed. Considering the glaring disparities in remuneration, conditions of service, skills development and economic access - these and other pressing issues related to the struggle for democratic and economic rights of women require urgent collaborative action between government, business, labour and wider civil society.

All these issues underscore how difficult and complex are the challenges associated with radical economic transformation. We must also acknowledge the uncomfortable reality that this task is going to have to be undertaken in the face of accumulating seismic changes in technology and shifts in the structure and systems of global production.

The inescapable imperative of securing a dramatically less energy-, carbon- and waste-intensive, environmentally sustainable growth path - across all sectors of the economy - requires much greater collaboration and calibration of policy and programmes across all of government and the SOCs. This will need to embrace the challenge of transitioning out of carbon-intensive, mostly coal-based production to renewable energy in a manner that has minimal socio-economic impact and grasps the significant industrial opportunities that will arise from this critical transition.

The damaging impact of a failure to secure this alignment is starkly illustrated in the stalled Renewable Energy Independent Power Producers Programme (REIPPPP) and the negative investment market signals which arose from this. Some of the opportunities and challenges in this regard are set out in the Green Industries and Water Industrialisation sections of IPAP 2018.

Gearing up for the Digital Industrial Revolution

The gathering impact of the new digital industrial revolution is already posing massive challenges to our national systems of skills, science and technology (including technology transfer and diffusion) and the infrastructure required for advanced communication and production. Effective national preparation for the Digital Industrial Revolution will require the simultaneous deployment of measures to support the private sector to face up to this challenge; and then supporting wherever possible concerted responses to the new opportunities that have and will increasingly arise. Again, some of the short-term interventions and policy perspectives which will be needed are summarised in the sections of IPAP 2018 on Science and Technology and the Digital Industrial Revolution.

Notwithstanding these enormous challenges - and bearing in mind that there is no industrial development silver bullet - it is imperative that SA stays the course, internalising the key lessons learned from a decade of implementing IPAP; and that it robustly removes the key barriers to industrial strategy.

Maintaining momentum, raising IPAP impact

The Economic Analysis section of IPAP 2018 demonstrates that across a range of economic indicators the global economy is showing moderate signs of recovery, notwithstanding on-going geopolitical and structural risks.

While South Africa's recent economic growth has lagged the global upturn and those of peer resource-intensive economies, recent positive developments in the political economy augur well for efforts to resolve the key domestic constraints and challenges which have often undermined the development effort over the past decade.

To build on the base of positive developments in the political economy - and to sustain and reinforce their momentum - one critical element will be the achievement of a much higher-impact industrial policy programme.

As I have said for the past two years, and still steadfastly believe: an even greater commitment towards the serious and concerted collaborative effort we have been proposing is non-negotiable: one which encompasses all spheres of government, the private sector and labour, all our most important tertiary and research institutions, and, most importantly, attends to the vital needs of all our people.

In conclusion I wish once again to thank all those in government, labour and the private sector, who have tirelessly supported the collective effort to re-industrialise our economy.



Dr Rob Davies MP
Minister of Trade and Industry

A MESSAGE FROM THE DIRECTOR-GENERAL



Mr Lionel October

The adoption of the National Industrial Policy Framework (NIPF) in 2007 introduced a very significant reorientation of South Africa's industrial policy landscape. Its main thrusts have been captured, developed and refined over the past 10 years in successive annual iterations of the Industrial Policy Action Plan. This has become the 'laboratory' for government's broad approach to industrialisation. From the outset we have recognised how complex the task of implementing industrial policy is – both from an institutional point of view and in the face of many external headwinds and domestic shocks.

We have repeatedly made the point that Industrial policy is multifaceted in nature, comprised of an interlocking set of policies and instruments that traverse the functions of many government departments and agencies; particularly those departments that comprise the Economic, Employment and Infrastructure Cluster. Thus, the responsibility for South Africa's industrial effort is a collective one, requiring all departments and agencies to take responsibility for fully aligning their policy and programmes with the broader industrial agenda.

History has demonstrated that industrialisation is integral to sustained and sustainable economic development. No countries have been able to lift substantial sections of their populations out of poverty without industrialising; and in most cases, rapidly growing economies have been characterised by an increasingly broad and diversified manufacturing sector. Manufacturing-led value addition has numerous well-recognised multiplier and spillover effects; and it embeds technology-intensity and skills formation as key elements of an upward and inclusive growth trajectory.

The socially transformative effects of industrialisation are all the more critical in the case of South Africa, which must continuously grapple with the devastating and deeply-entrenched structural legacy of apartheid, including resource dependence and the triple challenge of unemployment, poverty and race-based inequality.

Given the historical complexities and constraints that must be overcome in shifting onto an inclusive, value-adding industrialisation path, what then becomes a critical success factor is

our ability to create capacity – both within and around government – by following a steady course of 'learning by doing', adjusting all the while to the pressing challenges of a rapidly changing global economy.

We have consistently embraced a collaborative approach between government, the private sector and labour; an approach itself characterised by ongoing processes of mutual discovery. It is through this kind of collaboration - illustrated throughout IPAP 2018 – that we have been able to make significant headway in a number of sectors.

For the past 10 years, through all the policy instruments deployed since the first IPAP iteration – we have seen steady progress in some sectors, but sub-optimal outcomes in others. The Legacy Review and the Constraints sections of this year's IPAP in particular point to the areas where successes have been achieved and why; but they also pull no punches about the factors that have acted to block or inhibit crucially necessary interventions.

Wherever things have gone well, it has invariably been because deep and consistent partnerships have been in place. In this regard, it gives me great pleasure, once again, to recognise the invaluable contributions of the Department of Science and Technology, the Industrial Development Corporation and **the dti's** other supporting agencies. Without this support – and that of many other departments and institutions – the urgent work that needs to be done to drive the programmes set out in these pages over the year ahead (and beyond) would not be possible.

To all involved in these institutions, from both the public and private sector, we express our deep gratitude. As we celebrate the centenary of Nelson Mandela's birth, let us collectively intensify our efforts to secure a fast-paced industrialisation and economic development that will be able to lift most South Africans out of poverty and rid the economy of extreme unemployment and inequality.

Lionel October
Director-General, **the dti**

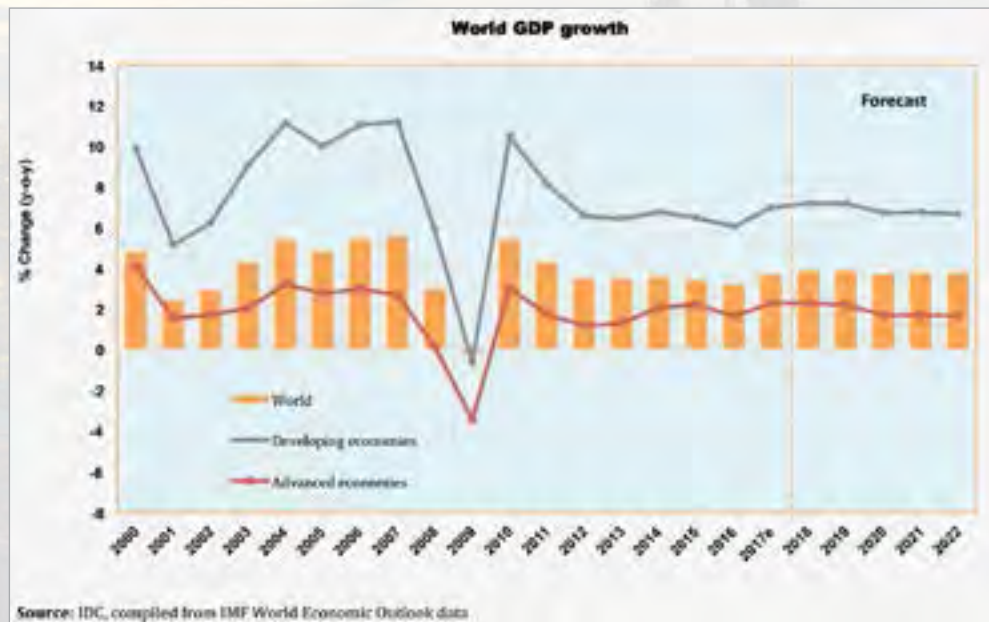


IPAP IN CONTEXT: ECONOMIC ANALYSIS



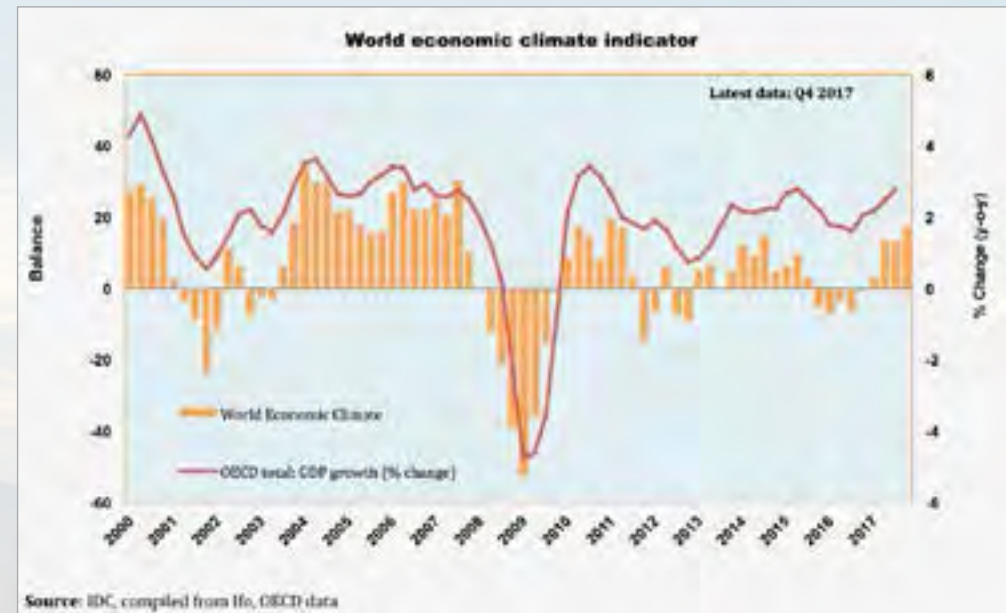
THE GLOBAL CONTEXT

The recovery from the financial crisis that rocked the world economy one decade ago has been long, painful and fragile. It has also relied on highly unconventional and protracted policy support from monetary authorities ('quantitative easing') particularly in advanced economies. Such extraordinary support is being gradually unwound as economic conditions normalise, in the process affecting financial and currency markets, capital flows and policy direction around the globe.



The pace of global economic expansion stood at only 3.2% as recently as 2016, the weakest rate of increase in world output since 2009. Activity levels improved in 2017, with output growth accelerating to 3.7% according to the latest estimates of the International Monetary Fund (IMF). Growth has also become more broad-based and synchronised from a regional perspective.

The outlook appears brighter, but forecasts for global growth are largely in line with the long-term average. Importantly, the downside risks are significant. These range from strong import barriers and supply-side tax and other measures to lure investment, instability in financial markets and significant geopolitical risks.



The slow, tentative improvement in business conditions globally has been reflected in the upwardly trending world economic climate indicator, which reached a six-year high in the fourth quarter of 2017.

Both the assessment of economic conditions at present and the outlook for the six months ahead improved further. Reports of favourable developments and expectations are emanating from several regions and countries, the principal exceptions being the Middle East and North Africa. To illustrate this, the economic climate indicator for the Eurozone has reached its highest level since 2000, whilst Sub-Saharan Africa's is at a two-year high.

The strong correlation between the economic climate indicator and overall growth (based on real GDP growth for the OECD countries) suggests that the pace of expansion is likely to gain further traction.

The expansion momentum is strengthening in the United States. The world's largest economy recorded 2.3% growth in 2017, up from 1.5% in 2016, with strong household spending, increased private sector fixed investment and an improved export performance as the key drivers. This is underpinned by consumer confidence levels at a 17-year high and a rebound in business sentiment. The US economy has added more than 17.8 million jobs since 2010,

reducing the unemployment rate from 10% in October 2009 to 4.1% by December 2017, the lowest in 17 years.

Growth in the Eurozone, an important destination for South Africa's manufactured exports, measured 2.5% in 2017, the fastest rate of expansion over the past decade.

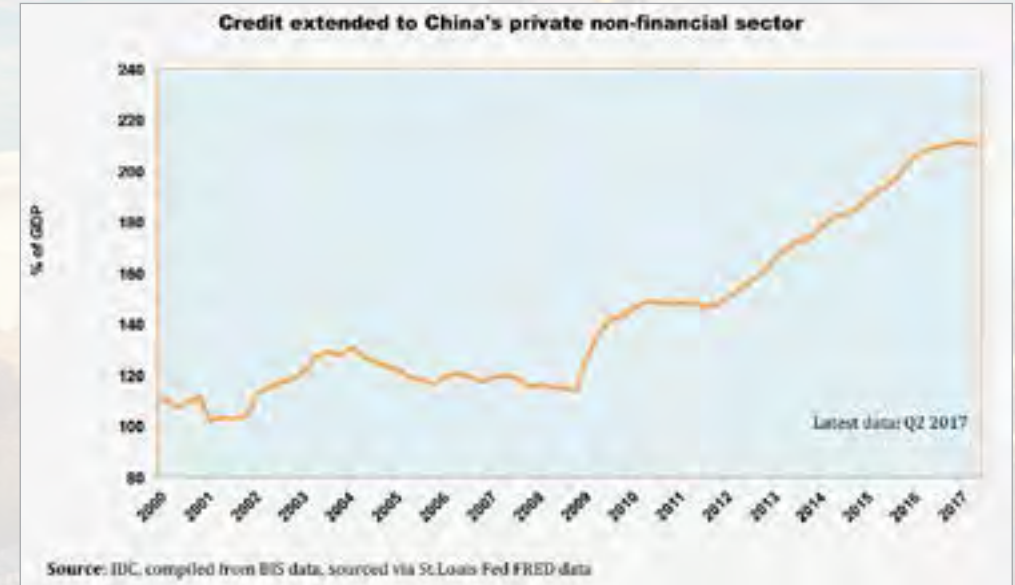


With consumer confidence at a 16-year high, retail sales are increasing strongly. Despite a stronger euro, exports have risen considerably, resulting in a widening trade surplus for the Eurozone at large, but mainly due to Germany's trade performance. Overall economic sentiment in this regional bloc has been on a steep upward trend.

Emerging markets and developing economies have become increasingly important in the world economy, making progressively higher contributions to global output, trade and investment. As a grouping, these economies now account for approximately 59% of world GDP, compared to 43% two decades ago. Furthermore, their contribution to global growth has more than doubled over this period to an estimated 75% in 2017.

Although the expansion momentum has been decelerating in China in recent years, the world's second largest economy and principal consumer of industrial commodities posted very strong growth in 2017, estimated at 6.8%. This has benefitted commodity markets, both in

terms of volume demand and prices, with positive implications for resource-reliant economies throughout the African continent. China's manufacturing output is still expanding, but at a very modest pace. Moreover, its growth trajectory has been fuelled by sharply rising debt, raising concerns over its sustainability as deleveraging efforts intensify.

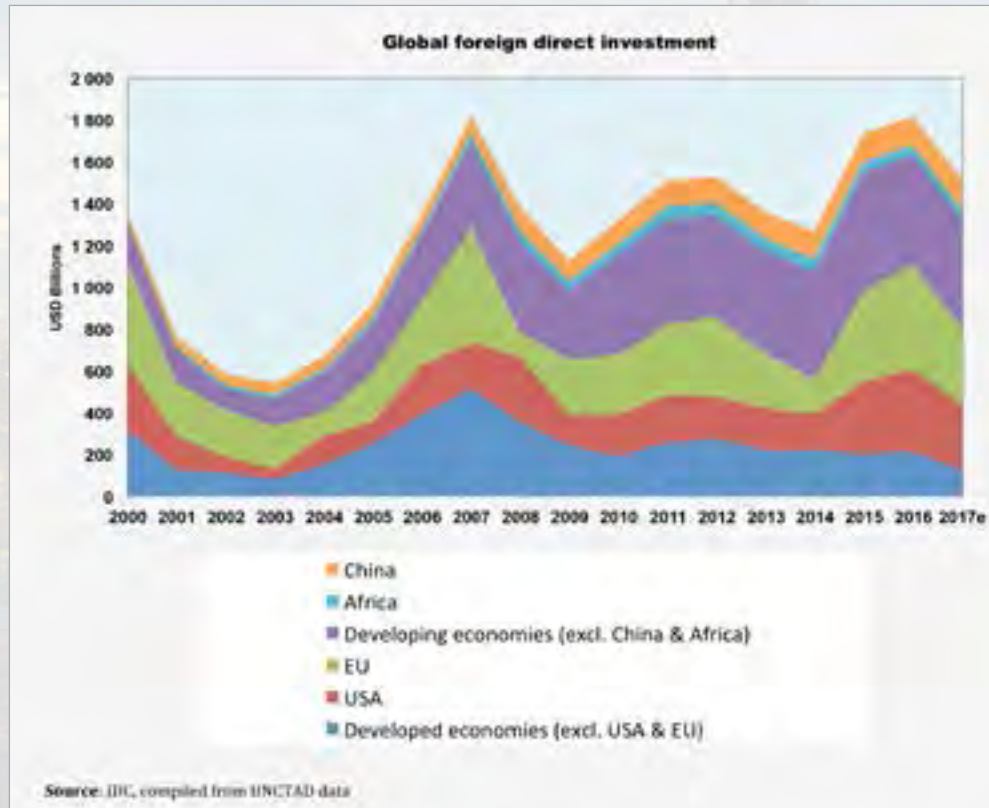


Manufacturing activity is increasing across the world, with the global manufacturing purchasing managers' index (PMI) reaching an 82-month high in December 2017. The US manufacturing sector continues to expand at a robust pace, with the January 2018 PMI having recorded its best reading since March 2015. Germany's PMI reached an all-time high as at the end of 2017, declining modestly in January and February 2018, while Spain's reached its highest point in almost 11 years in November 2017 (56.1), with a similar reading of 56 recorded in February 2018.

Services-related activities are also on the rise, with the February 2018 global composite PMI (manufacturing and services) standing at its highest level in almost three and a half years.

Notwithstanding the improving economic climate, global foreign direct investment (FDI) is estimated by UNCTAD to have fallen by 16% to US\$ 1.5 trillion in 2017.

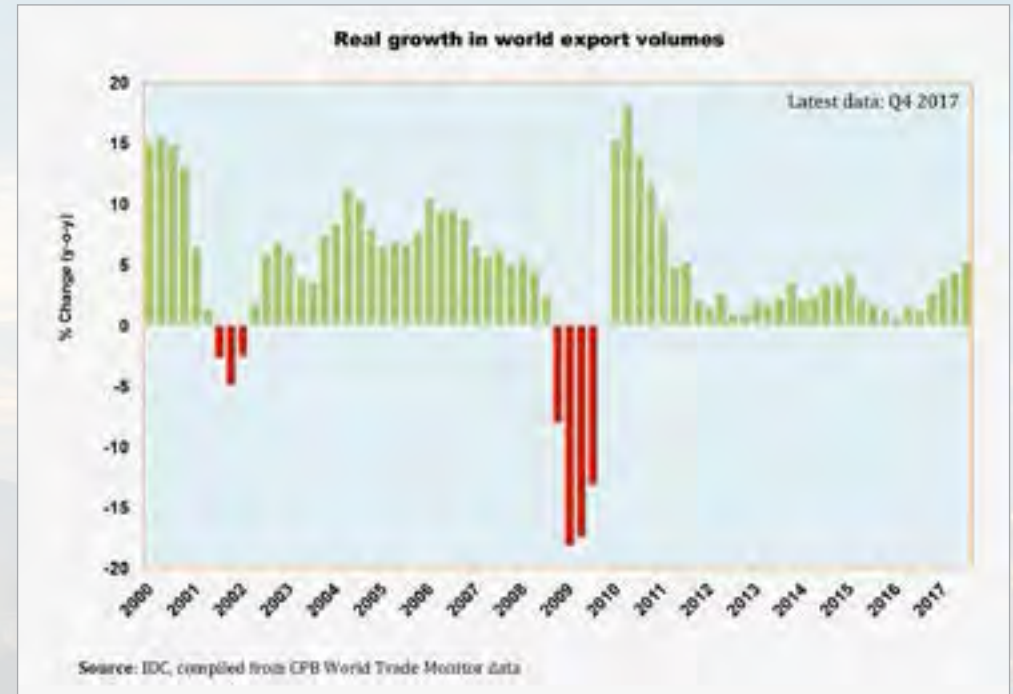
Large declines in FDI inflows were reported by developed economies, particularly the United Kingdom and the United States. Modestly higher inflows were recorded by developing Asia (including China), as well as by Latin America and the Caribbean.



In contrast, FDI flows into Africa are estimated to have fallen by 1% to US\$ 49 billion, largely reflecting adverse conditions in commodity markets and their associated impact on the economic performance of many African economies.

FDI flows to South Africa, however, are estimated by UNCTAD to have risen by 43% in 2017 to US\$ 3.2 billion; a welcome improvement, albeit still well below historical levels.

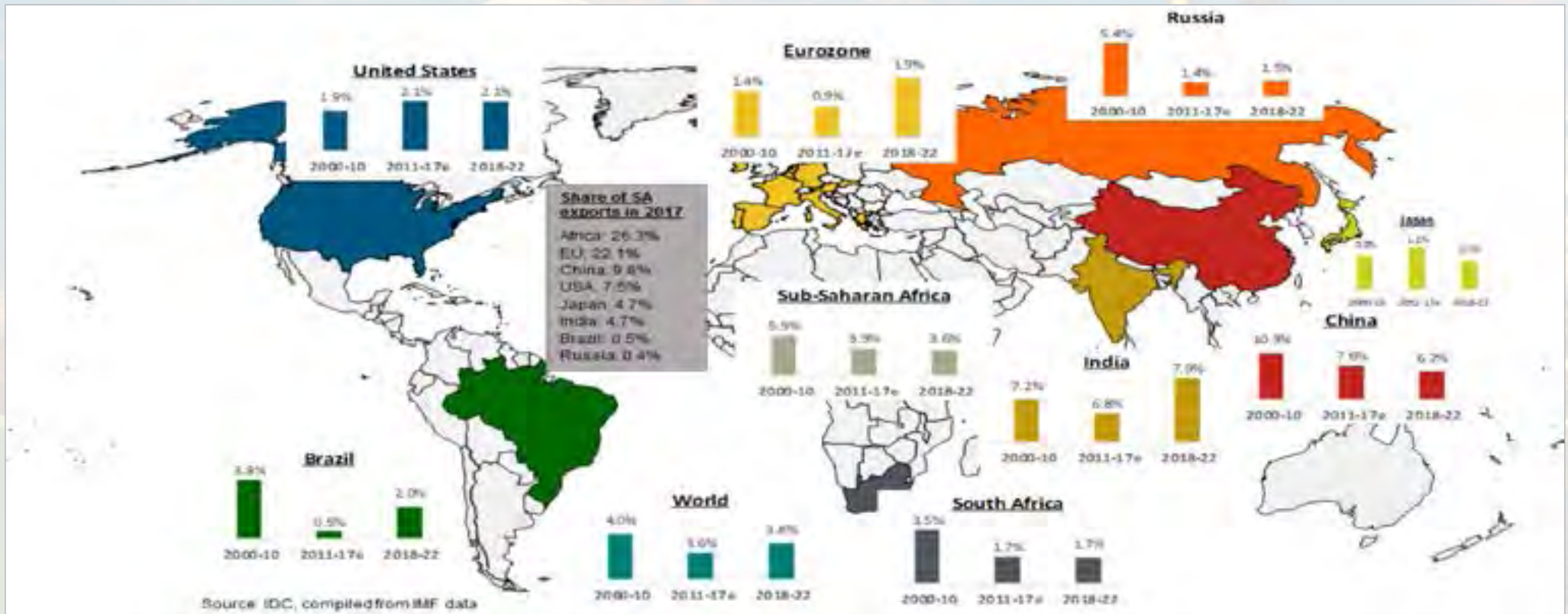
World trade has been improving steadily. The gradual recovery in export volumes is reflective of increasing economic activity, consumption spending and investment expenditure around the globe.



Rising import demand internationally is particularly important for the South African economy, especially in light of weak demand conditions on the home front, which are imposing a drag on its growth performance.

The following chart shows the historical economic growth performance and five-year outlook for key trading and investment partners of South Africa, as well as for other BRICS economies. Collectively, the illustrated regions and individual economies accounted for 76% of South Africa's overall merchandise exports in 2017. The growth outlook for several key trading partners bodes well for local export-oriented manufacturers and commodity producers.

Real GDP growth in select individual or regional economies (average annual rates; IMF forecasts for the period 2018-2022)



As indicated in the table that follows below (page 15) just over 26% of South Africa's overall exports, valued at R311.4 billion, were sold in other African markets in 2017. The African continent was in fact the leading external market for South Africa's manufactured exports, dominated by non-electrical machinery, processed food, chemical products as well as motor vehicles, parts and accessories.

Improving economic prospects for many African economies are expected to provide a solid basis for a stronger export performance, for the enhancement of South Africa's manufacturing capacity, as well as for increased regional integration through the development of cross-border value chains.

South Africa's merchandise exports to the European Union (EU) were valued at around R262 billion in 2017. The export basket was dominated by motor vehicles, parts and accessories,

which accounted for approximately 32% of the total. Platinum group metals (PGMs) followed with a 12% share of the export basket to the EU.

The Chinese economy absorbed 19.7% of South Africa's mining exports in 2017. These included 62% of iron ore exports and 45% of non-ferrous metal ores (e.g. chrome, manganese, copper) exports. However, only 3.9% of South Africa's manufactured exports were destined for China in 2017. These comprised mostly of base metals, paper and paper products, as well as processed food. The export basket to the US is dominated by PGM exports, which represented almost 23% of the total, while motor vehicles, parts and accessories accounted for a further 21.2%.

The South African export basket 2017

Major South African merchandise exports to select regions and countries in 2017								
Rank	African countries: R311.4 billion or 26.3% of SA exports		European Union: R261.6 billion or 22.1% of SA exports		China: R115.6 billion or 9.8% of SA exports		USA: R88.7 billion or 7.5% of SA exports	
	Sector	% share	Sector	% share	Sector	% share	Sector	% share
1	Non-electrical machinery	11.6	Motor vehicles, parts and accessories	31.9	Other mining (e.g. chrome, manganese)	37.7	PGMs	22.7
2	Processed food	10.5	PGMs	11.7	Iron ore	34.2	Motor vehicles, parts and accessories	21.2
3	Chemical products (e.g. pharmaceuticals)	7.7	Agriculture, forestry & fishing	8.7	Basic iron and steel products	10.1	Basic iron and steel products	12.5
4	Motor vehicles, parts and accessories	7.6	Other mining (e.g. chrome, manganese)	7.3	Agriculture, forestry & fishing	4.3	Other mining (e.g. chrome, manganese)	7.6
5	Petroleum and petroleum products	7.1	Basic iron and steel products	6.2	Non-ferrous metal products	3.7	Non-ferrous metal products	7.0
6	Other mining (e.g. chrome, manganese)	6.1	Other manufacturing	4.2	Paper and paper products	3.0	Industrial chemicals	6.2
7	Basic iron and steel products	5.2	Industrial chemicals	4.1	Processed food	1.3	Other manufacturing	5.5
8	Industrial chemicals	4.6	Processed food	2.9	Industrial chemicals	1.0	Chemical products (e.g. pharmaceuticals)	2.4
9	Fabricated metal products	4.3	Non-ferrous metal products	2.9	Other manufacturing	0.7	Agriculture, forestry & fishing	2.3
10	Agriculture, forestry & fishing	4.0	Iron ore	2.8	PGMs	0.7	Non-electrical machinery	2.1
11	Electrical machinery	3.4	Coal mining	2.5	Chemical products (e.g. pharmaceuticals)	0.7	Processed food	1.6
12	Beverages	2.5	Chemical products (e.g. pharmaceuticals)	2.5	Beverages	0.4	Other transport equipment	1.5
	Cumulative %	74.7	Cumulative %	87.6	Cumulative %	98.0	Cumulative %	92.6

THE SOUTH AFRICAN ECONOMY

The South African economy is exhibiting welcome signs of recovery after experiencing relatively subdued and declining growth for a number of years. Over the period 2010 to 2017, real GDP growth averaged 2.0% per year, well short of the desired rate of around 5% deemed necessary on a sustained basis in order to meaningfully address the triple challenge of poverty, unemployment and inequality.

At 0.6%, GDP growth in 2016 was the lowest since the 2009 recession. Besides the global economic slowdown, which affected South Africa's export performance and foreign direct investment, several domestic factors and developments affected the economy's performance. Chief amongst these was the worst drought on record, which not only affected agricultural output, employment and investment, but, through important linkages with many other sectors of the economy, impacted on production activity across many supplying industries.

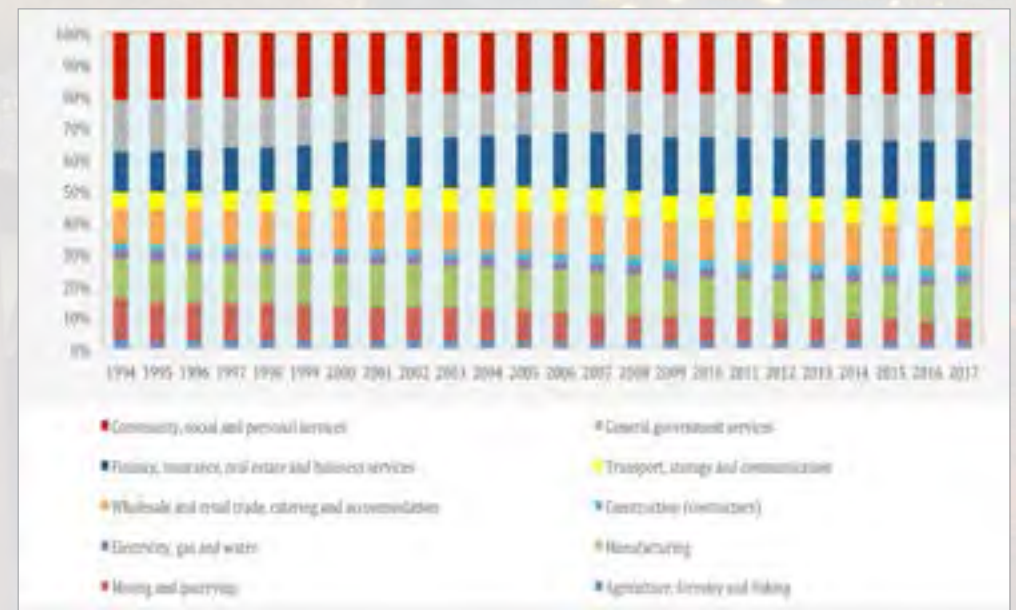
From 2003 to 2008, Gross Fixed Capital Formation (GFCF) grew strongly as the commodity super-cycle led to investments in South Africa's core manufacturing sectors, which registered a combined Compound Annual Growth Rate (CAGR) of over 13% for the period.

From the onset of the Global Financial Crisis in 2009 to 2014, these same sectors experienced CAGR of just 2%, while manufacturing shed almost 200,000 jobs.

In the aftermath of the crisis, South Africa deployed a range of policy interventions, including an infrastructure build programme and supply-side support measures such as the Manufacturing Competitiveness Enhancement Programme (MCEP).

Although almost all sectors have grown since 1994 (in real terms), the productive sectors which are crucial for long-term growth and job creation have grown significantly more slowly than services sectors.

The following chart illustrates the growing predominance of the finance, insurance and real estate (F.I.R.E.) sectors against the relative stasis or decline of all the other sectors. This illustrates sharply the deep-seated structural problems in the domestic economy.



Source: Data - SARB; Graph - the dti

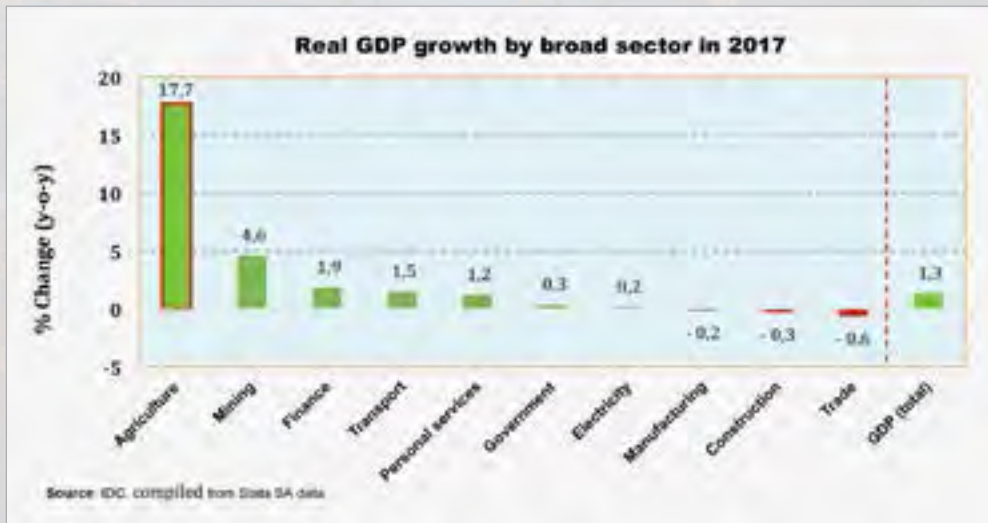
In the manufacturing sector, the most striking structural feature is its concentration on just 6 subsectors: Food-processing, Coke and Petroleum Products, Other Chemicals, Basic Iron & Steel, Metal Products and Automotives. In 1994, these 6 sub-sectors accounted for approximately 37% of total manufacturing value-added. By 2015, these same subsectors accounted for almost 50% of MVA.

From a policy perspective, it is encouraging to see the strong growth in Automotives and Other Transport Equipment, the stabilisation of the threatened Clothing, Textiles, Leather and Footwear (CTLF) sectors and the employment-rich growth of the Business Process Services (BPS) sector, as these are areas in which Government has intervened decisively.

But the degree of concentration in manufacturing leaves South Africa exposed and vulnerable to both internal and external shocks. In recent years, South Africa has experienced both.

Causal factors included sub-optimal performance of state owned companies (SOCs), sharply escalating administered prices, logistical bottlenecks and other economic infrastructure constraints.

The short term good news was that the economy expanded by a better than expected 1.3% in 2017. The recovery was mainly due to a strong rebound in agricultural output, propelled by the largest maize crop on record, as climatic conditions normalised in many parts of the country.



The mining sector also made a significant contribution to overall GDP growth, but the pace of expansion remained rather weak across most other sectors, reflective of a difficult business and operating environment. Low consumer and business confidence have been impacting on activity levels across many industries and services sectors, resulting in surplus production capacity, weak investment expenditure and low employment creation.

Excluding agriculture, economic growth would have measured only 0.9% in 2017. This demonstrates the fragility of the recovery and the urgency of restoring consumer, business and investor confidence in the economy.

Household consumption expenditure, which accounts for roughly 60% of national GDP, expanded by 2.2% in 2017. Although better than anticipated, this number still reflects the challenges faced by lower income South African households - particularly high levels of indebtedness, modest growth in disposable incomes and poor employment prospects for many.



The weak economic climate will continue to affect the ability and willingness of consumers to raise their spending for some time, although lower inflation and interest rates should provide some relief to debt-ridden consumers, especially over the short-term.

The fragility of this mini-recovery points towards the single most significant structural problem that has inhibited robust growth in the domestic economy for a sustained period of time: namely, the fact that fixed investment activity has been anaemic, especially in the productive sectors of the economy.

In the face of sharp financial constraints and weak demand for their services – exacerbated by serious institutional failures - public corporations lowered infrastructure spending, mothballing certain operations, postponing some projects and cancelling others. This severely reduced their procurement of locally produced input materials and services, impacting on the performance of many other sectors of economic activity.

Faced by severe fiscal challenges, general government has had to cut back on its spending on economic and social infrastructure over the past two years, with real fixed investment spending by government having dropped by 4.1% between 2015 and 2017.



The factors which have weighed heavily on fixed investment by the private sector are complex. Aside from weak demand and excess production capacity in many sectors, developments on the political front weighed heavily on the private sector's propensity to invest. Political

uncertainty was compounded by policy uncertainty and misalignment in key sectors such as mining and agriculture, as well as the threat of further downgrades to South Africa's sovereign credit ratings.

Fixed investment spending by the private sector consequently declined in real terms in 2015 (-0.5%) and in 2016 (-5.3%), with a modest rise of 1.2% during 2017.



Business confidence has remained below the crucial 50-point mark for most of the past decade, indicating a degree of pessimism regarding operating conditions. Although recovering some ground in the second semester of 2017, it remained at low levels. A reading of 34 index points in the fourth quarter of 2017 indicates that most of the survey respondents remained very dissatisfied with domestic economic conditions.

Not only have confidence levels been low for an extended period, but the largely unfavourable sentiment has been prevalent across all sectors surveyed, including manufacturing, retail and wholesale trade and the motor trade.

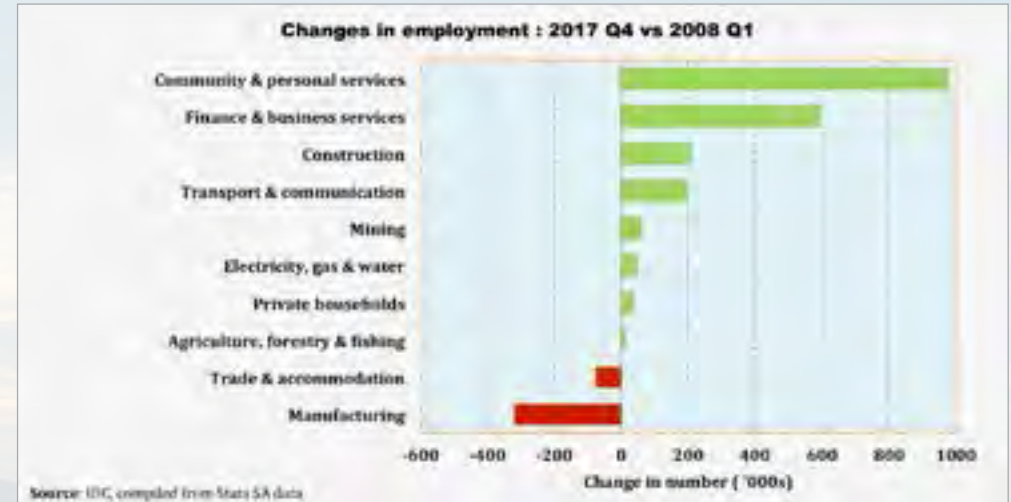
Amongst manufacturers, business confidence recovered from the eight-year low recorded in the second quarter of 2017, rising by 21 points to 37 points in the first quarter of 2018. Nevertheless, more than 60% of survey respondents in the manufacturing sector have indicated that they are unhappy with prevailing business conditions.



Improving conditions in external markets, gradually rising retail sales and very recent developments in the political arena are, however, likely to impact positively on business and investor confidence going forward, potentially propelling a sustained upturn in fixed investment activity.

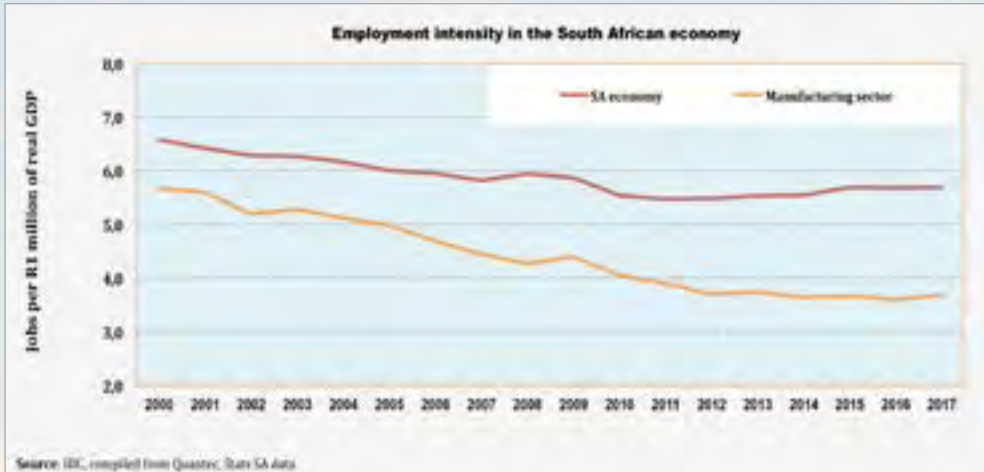
This, however, is far from a given. The economy's subdued performance over the past decade - with real GDP having expanded at an average annual rate of just 1.8% per annum from 2008 to 2017 - shows how far there still is to travel before getting close to adequate job creation for an expanding labour force.

From the start of 2008, the economy did manage to create an additional 1.75 million new job opportunities; most of these in the broader public sector, which forms part of the 'Community and Personal Services' category below.

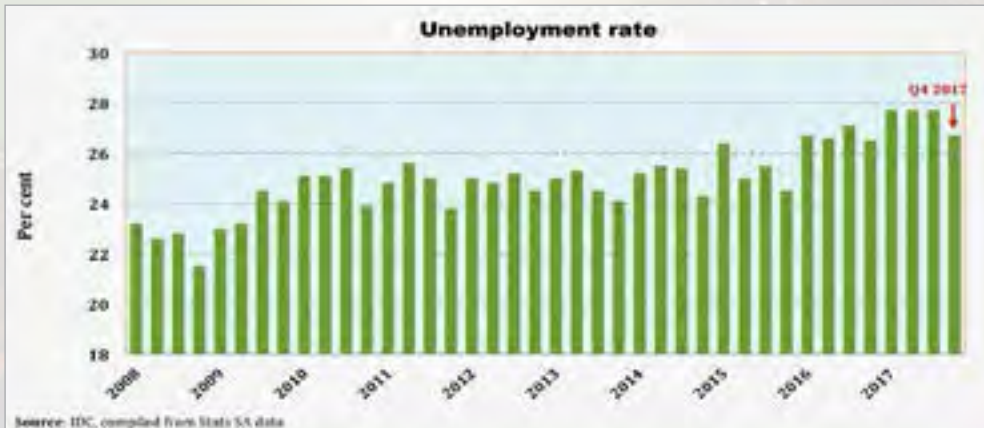


It is important to note that the creation of any and all new job opportunities has to be set in the context of the approximately 1.12 million domestic jobs that were lost in the economy during the global financial crisis and the ensuing economic recession. The manufacturing sector was hardest hit - currently employing about 320,000 fewer people than in 2008.

At a deeper structural level, a worrying trend is the declining employment intensity of the South African economy - even more pronounced in the manufacturing sector - as indicated by the employment-to-GDP ratio over time. Although this trend is not unique to South Africa, it manifests in a particularly acute form here - highlighting the urgent need for all stakeholders to get to grips with a set of interlinked and mutually reinforcing problems with potentially seriously destabilising socio-economic potentiality.



The inability of the economy to create sufficient jobs for an expanding labour force has been reflected over the past decade and more in a continuously rising overall unemployment rate, moving towards 27.7% over the first three quarters of 2017, the highest in 14 years. Though there has very recently been a modest decline - to 26.7% in the final quarter of 2017 – this does not yet suggest the emergence of any solid downward trend.



Some 5.9 million people currently remain unemployed, and, if discouraged work-seekers are included, the number of unemployed rises to 9.2 million - or 36.3% of the population.

Of further major concern are the following:

- approximately two-thirds of the unemployed have been without a job for more than one year;
- the skills/education profile of the unemployed is particularly low and is not being adequately addressed, especially in a period that increasingly requires advanced technical skills to succeed in a fiercely competitive global economic environment.

If the aim is, as it must be, to raise the economy's growth-to-employment potential to a much higher level, key realities will have to be factored in; not least the systemic and institutional challenges that will have to be overcome if South Africa is to find its own unique solutions to creating meaningful work and life opportunities in the context of the global trend towards ever greater technology- and capital-intensity.

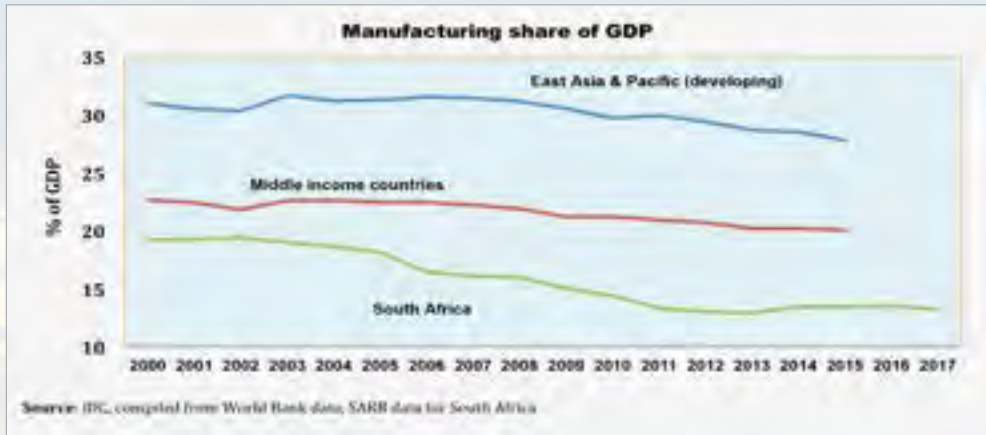
The labour absorption capacity of the economy must therefore be taken very seriously and tackled with great urgency, beginning with a concentrated focus on sectors like agro-processing and, amongst others, the components value chain; and these initiatives must be consciously and creatively aligned with finding new areas of employment directly opened up by the Digital Industrial Revolution.

DEVELOPMENTS IN SOUTH AFRICA'S MANUFACTURING SECTOR

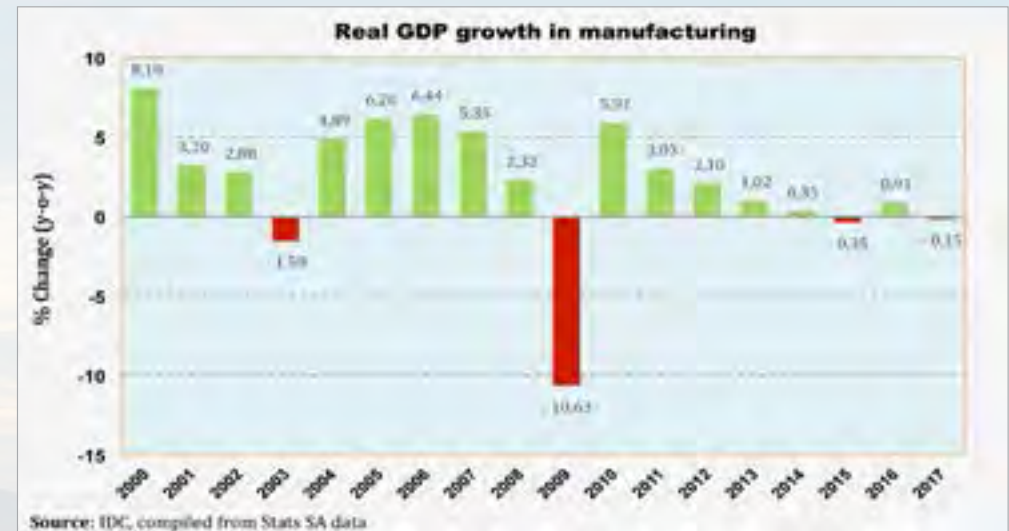
The manufacturing sector has been under severe strain in recent years.

The contribution made by the sector to South Africa's GDP has declined over time, to only 13.2% by 2017, from the all-time high of almost 25% recorded in 1981.

This compares extremely poorly from a global perspective, because this level of contribution falls well short of the ratios achieved by developing economies in the East Asia and Pacific region, as well as by the middle-income countries as a group. Moreover, even though the shares of overall GDP claimed by the manufacturing sector in these peer groups have been declining over time, the adverse trend has been far more pronounced in the case of South Africa.



What there should be no debate about is that the manufacturing sector remains vitally important for the South African economy. This because of its strong employment and economic linkages with various supplier and supporting industries and service providers, its employment potential and its contribution to the balance of payments - generating export earnings and reducing import requirements. South African manufacturing has a small bridgehead to work from. After contracting over the three previous consecutive quarters, output rebounded moderately in the second quarter of 2017 and gained some further momentum in the third and final quarters of the year.¹



The challenge will be to maintain and build on this still very modest momentum. This is no easy matter, as operating conditions continue to remain challenging. As illustrated in the chart below, apart from the food and beverages and metals and machinery sub-sectors (and a very small increase in the furniture and other industries sub-sector) lower output was recorded by all other manufacturing sub-sectors.

In addition, the global steel crisis impacted negatively on the performance of the domestic steel industry, with low-priced imports competing aggressively in a local market already characterised by weak demand conditions.

Similarly, the clothing and textiles sector – despite major improvements in processes and productivity actively supported by **the dti** - continues to feel intense pressure from cheaper (and often illegal) imports.

Even in the more highly structured automotives industry, subdued local and global consumer demand have impacted on the achievements it has racked up over the past five years and more.

¹ In 2017, on a quarterly basis, growth in manufacturing GDP was as follows (q-o-q, seasonally adjusted and annualised): Q1: -4.1%; Q2: +2.9%; Q3: +3.7%; Q4: +4.3%.

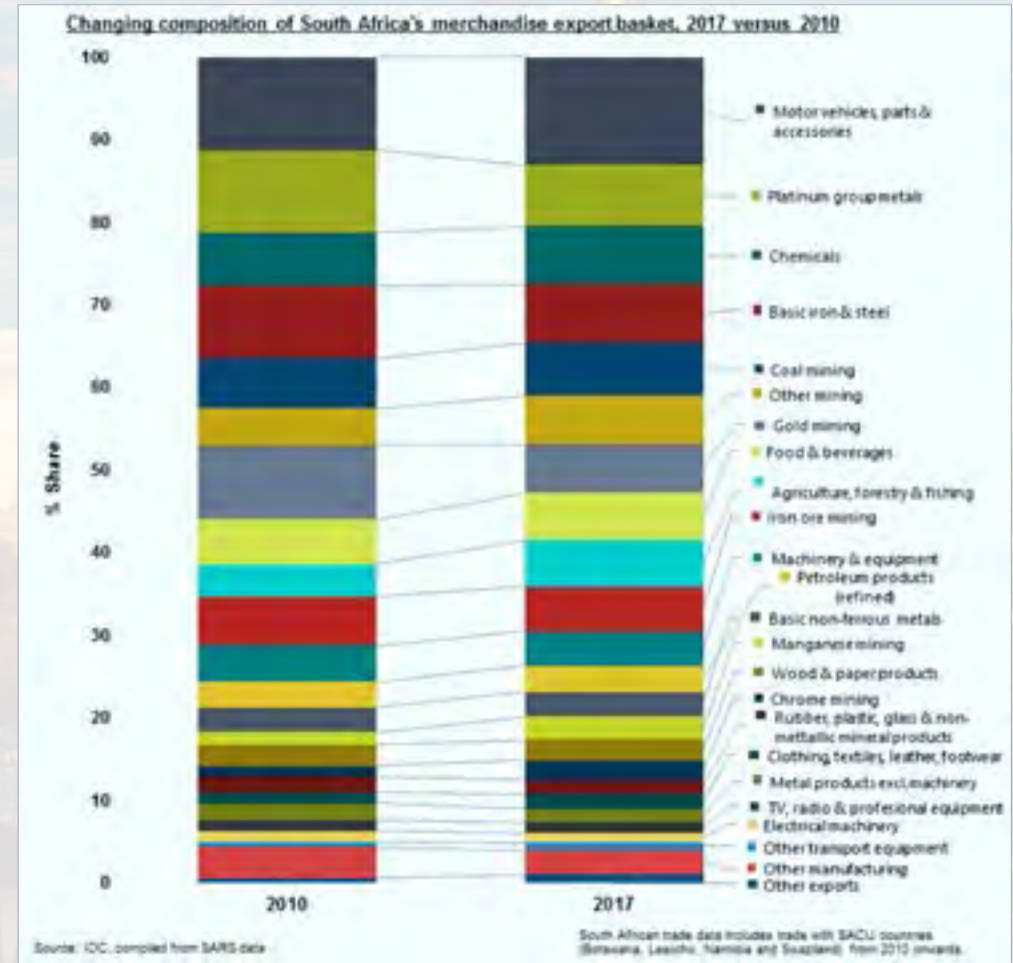
The continuing difficult global and domestic operating environment has certainly taken its toll on the manufacturing sector in many different ways. Overall output volumes are still stuck at 10% lower than in the pre-crisis peak, and surplus production capacity exists in many sub-sectors. In the final quarter of 2017, 70% of all manufacturers indicated that output levels still remain well below capacity. This is naturally affecting investment decisions and further constraining possibilities for employment creation.

EXTERNAL TRADE

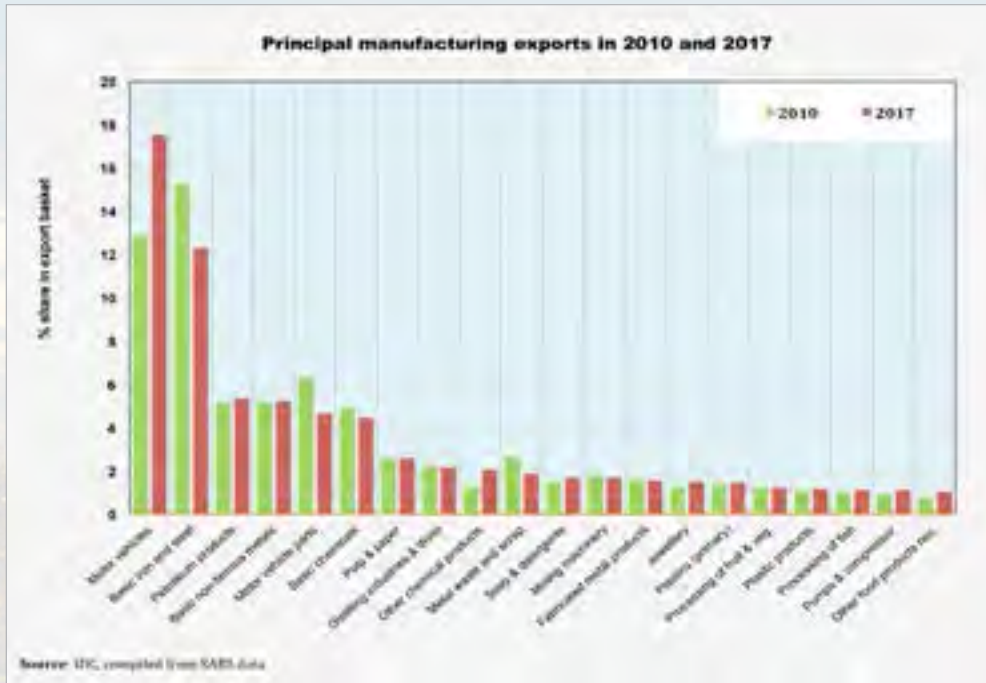
Improving economic conditions globally, including rising demand in key external markets and generally higher commodity prices, have been providing export opportunities for domestic producers. Import growth, in turn, has been contained by weaker domestic demand as the economic environment worsened. South Africa's balance of trade recorded a R75 billion surplus in 2017, compared to a deficit of R2.5 billion in 2016. The largest contribution to the surplus was made by the mining sector, as higher commodity prices translated into a 23.5% increase (or R81.2 billion) in export proceeds.

The bumper maize crop, which resulted in a substantial surplus on the domestic market, permitted a significantly better agricultural export performance in 2017. The manufacturing sector, however, remains a substantial drag on export performance, having registered sizeable trade deficits over all the years 2010-2017.

South Africa's export basket has become somewhat more diversified in terms of its sectoral composition. Utilising a normalised Herfindahl-Hirschman Index, which is used to calculate the level of concentration or diversification within a basket, the sectoral concentration decreased from 18.4 in 2010 to 16.3 in 2017. However, a reading above 15 still indicates a medium level of concentration in the sectoral basket.



The merchandise export basket is indeed still concentrated on a few sectors, especially within manufacturing.



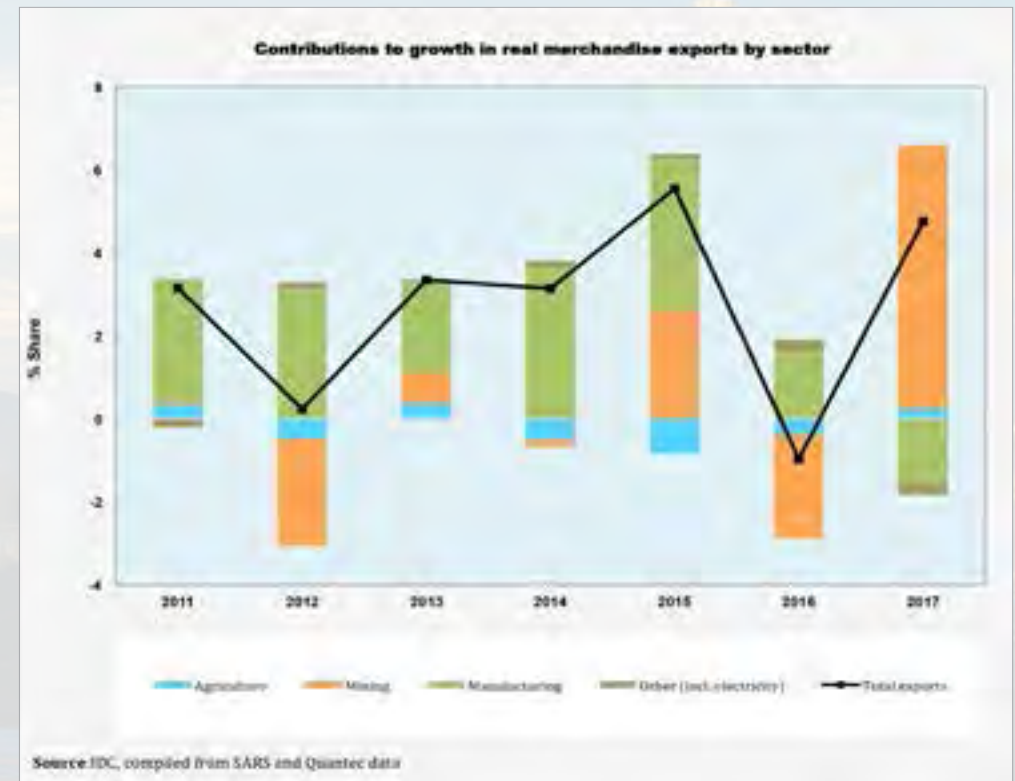
But the economy remains heavily reliant on mining exports for foreign exchange earnings. Exports of mining and mineral products accounted for 36.2% of merchandise exports in 2017, slightly lower than the 38.2% share recorded in 2010.

During 2016, weaker demand for industrial commodities in international markets, especially from China (which in turn dragged prices down) took a toll on South Africa's mining exports. In addition, the domestic mining sector also faced significant operational challenges.

All of the mining sub-sectors recorded lower export volumes in 2016, with the steepest decline reported by the copper mining segment - a 27% drop. The gold, iron ore and coal mining sub-sectors also reported substantially lower export volumes.

Mining export volumes remained generally under pressure in 2017. However, in nominal value terms, mining exports rose by 23.5% to R427.3 billion, largely due to a weaker currency and higher commodity prices. Consequently, the mining sector made a significant contribution

to real growth in overall exports during 2017, contrasting sharply with the negative impact recorded in 2016.



Over time, the historical reliance on gold has been substantially reduced, whereas iron ore and coal exports have come to the fore. PGMs have also contributed to diversifying the composition of South Africa's mineral export basket. However, despite rising PGM export volumes since the recent trough in 2012, the platinum price fell from an average of US\$ 1,610 per ounce in 2010 to US\$ 952 per ounce in 2017. This underscored the declining share claimed by PGMs within the overall export basket, from 9.9% in 2010 to 7.4% in 2017, in nominal value terms.

Manufacturing exports

The manufacturing sector made substantial contributions to real growth in merchandise exports over the period 2011 to 2016. However, due to a difficult domestic operating environment and demand moderation in some markets, exports of manufactured goods came under pressure in 2017, subtracting 1.6 percentage points from overall export growth.

Other manufacturing sub-sectors that also reported lower export sales in nominal terms, included: other transport equipment; machinery and equipment; television, radio and communication equipment and processed food. The sub-sectors that recorded higher exports in 2017 included chemicals and chemical products; basic iron and steel; non-ferrous metal products; refined petroleum products and textiles.

The manufacturing sector accounted for 57.2% of the overall export basket in 2017, a similar level to that recorded in 2010. However, the composition of the manufacturing export basket has changed over the years, with a substantial rise in the relative share claimed by the motor vehicles sub-sector.



Export sales of motor vehicles, parts and accessories were 4.2% lower (or R6.7 billion) in nominal value terms in 2017, illustrating the challenging global trading environment in recent years. The exception was the year 2015, when vehicle exports rose sharply, particularly passenger cars.

The motor vehicles, parts and accessories sub-sector, which has benefitted from sustained industrial policy support over the decade, is reaping the benefits of increased integration into global supply chains and is providing opportunities for domestic production (and exports) of parts and accessories for motor vehicles. This sub-sector has been the leading exporter within manufacturing since 2012. Its value-added (GDP) measured R31.6 billion in 2016, equivalent to 5.9% of total manufacturing GDP, and it employed 94,181 people, or 6.8% of manufacturing employment.

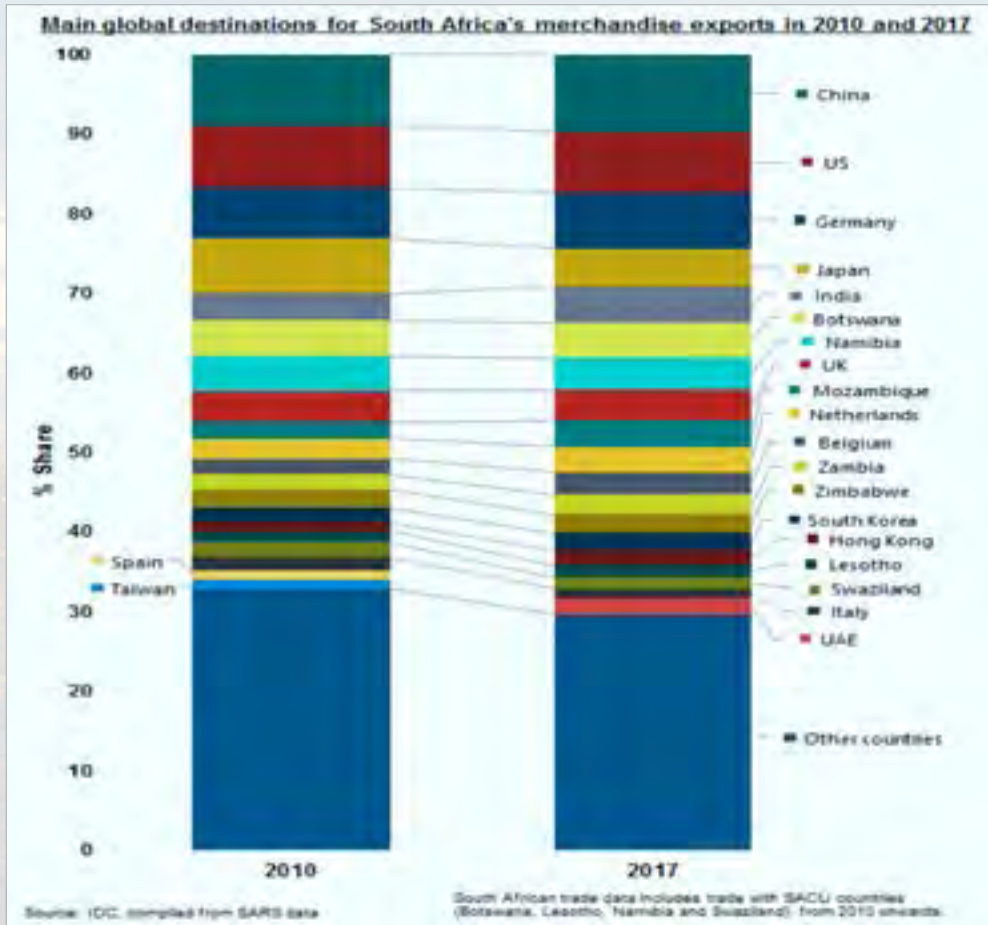
Its combined share of the overall merchandise export basket rose from 11.3% in 2010 to 13% in 2017. However, within the manufacturing sector itself, the share of motor vehicles (excluding parts and accessories) rose from 13% in 2010 to 17.5% in 2017.

By contrast, the relative share of the basic iron and steel sub-sector in South Africa's export basket has fallen over time. Having accounted for 15.3% of manufactured exports in 2010, its share fell to 11.4% in 2015, before increasing to 12.3% by 2017.

This sub-sector has been facing fierce competition in the global market and considerable import penetration on the domestic front. Confronted with weak demand, foreign producers have been dumping their surplus steel output in world markets, leading to the imposition of protective measures in certain instances. South Africa itself has been rolling out industrial support measures to safeguard its basic iron and steel production capacity and support the downstream steel sector.

Global and regional export destinations

The geographical reach of South Africa's export basket has become more diversified over time, with emerging markets like China and India having come to the fore quite strongly, and the rest of the African continent featuring even more prominently. This is confirmed by the normalised Herfindahl-Hirschman Index, which declined from 21.6 in 2010 to 20.2 by 2017.



Diversifying both the product mix and the regional destinations of South Africa's exports not only supports economic activity in the currently challenging domestic environment but is also imperative in protecting the economy from major disruptions in specific markets or sudden, unpredictable declines in product demand in particular sectors.

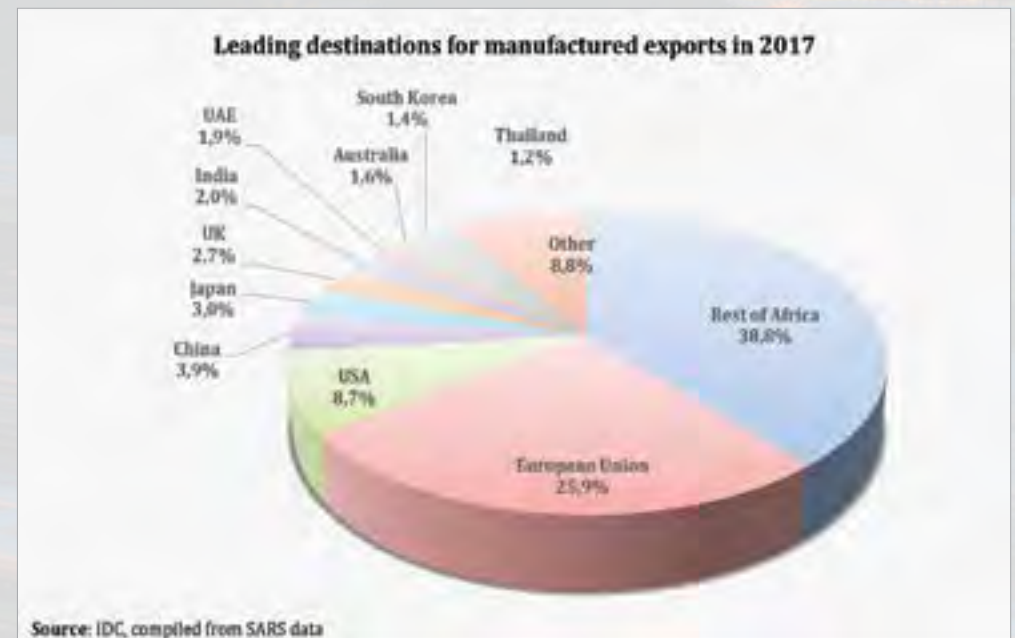
Having accounted for a mere 1.2% of South Africa's merchandise exports in 2000, China has become the single largest export market at the individual country level. Its share peaked at 12.9% in 2013, but has been quite volatile in recent years, declining to 9.8% in 2017.

The combined share of the export basket claimed by the advanced economies fell from 40% in 2010 to 38.6% in 2017. Both the US and Japan have seen their respective shares declining over time towards 7.5% and 4.7%, respectively, in 2017 (compared to 7.9% and 7.0%, respectively, in 2010). In contrast, the European Union saw its share rise substantially from 17.5% in 2012 to 22.1% by 2017.

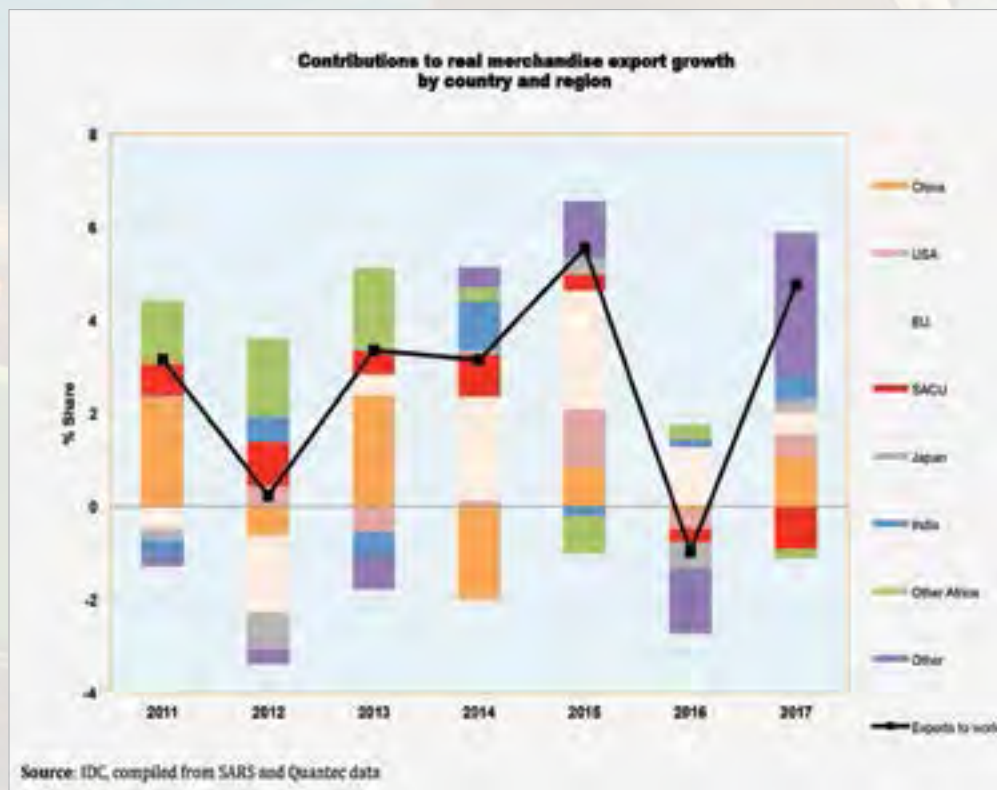
The African continent has become the largest regional market for South Africa's merchandise exports. In 2017, some 26.3% (or R311.4 billion) of the entire export basket was destined to countries elsewhere in Africa, a slight increase from the 25.4% share recorded in 2010. The continent is also the largest regional destination for South Africa's manufactured exports, accounting for 38.8% of the total.

The export basket to the rest of Africa is dominated by machinery and equipment, processed food products, chemical products (e.g. pharmaceuticals), motor vehicles and parts, petroleum and petroleum products, as well as basic iron and steel.

The European Union also remains a key export market, with 25.9% of all manufactured exports being sold in this regional bloc in 2017.



In real terms, overall growth in South Africa's merchandise exports to the world at large was relatively robust over the period 2011 to 2015, considering the challenging global trading environment at the time. However, after having expanded by 5.5% in 2015, merchandise export trade contracted by 1% in real terms in 2016. A sharp rebound was recorded in 2017, with positive contributions made by most regions, with the exception of other member states of the South African Customs Union (SACU).



CONCLUSION: JOB CREATION AND THE NEED FOR STRUCTURAL CHANGE

The current structure of the SA economy is ill-suited to the creation of large numbers of jobs at appropriate skill levels.

By this we mean that:

- the composition of the economy by sector (primary, secondary, and tertiary) is not appropriate for South Africa, given widespread and well-known developmental challenges;
- within sectors (e.g. manufacturing), labour-intensive sectors are not growing fast enough to create large numbers of jobs;
- jobs in the tertiary sectors are not substitutes for jobs in the productive sectors; rather, the development of higher value-added productive sectors creates multipliers that support better quality jobs in the tertiary sectors;
- imports (legal and illegal) have become a major economic leakage. This is linked to the size of the illicit economy, including the 'Discount Mall' phenomenon;
- Apartheid spatial geography continues to constrain the economy in terms of worker travel time and costs.

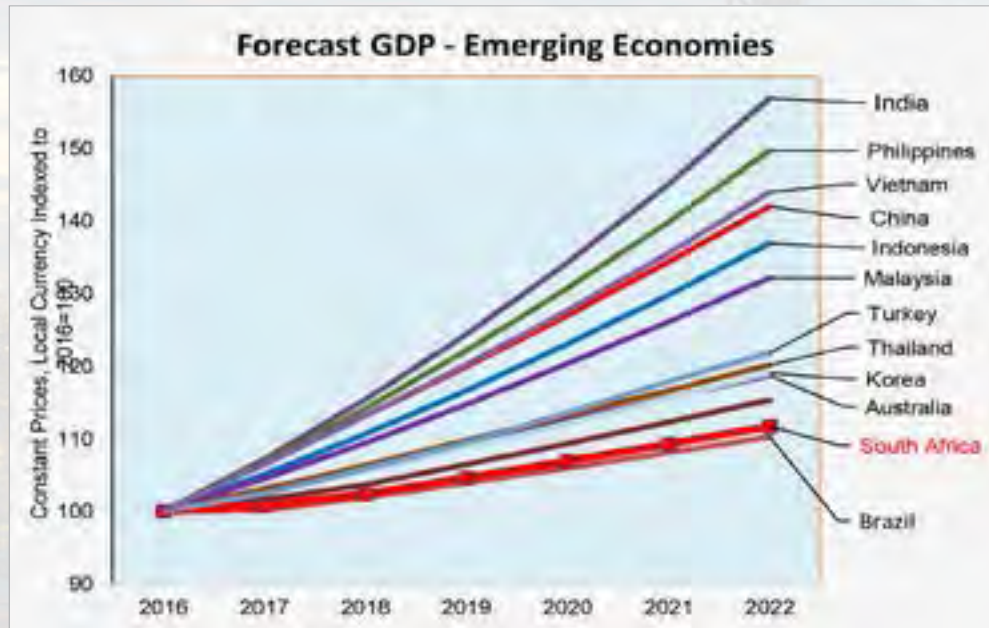
But – unlike many other developing countries – SA *has* managed to prevent major hollowing-out of its industrial capacity. This has been achieved through the judicious use of incentives and the successful deployment of industrial policy interventions to manage critical challenges in, amongst others, the steel, CTLF and autos sectors.

Nevertheless, despite industrial policy successes in a number of sectors, it has to be recognised that the manufacturing sector may be nearing a tipping-point.

If the conditions set out below persist, there is a substantial risk that **dti** interventions will simply not be sufficient to prevent further hollowing out of industrial capacity:

- low business and consumer confidence;
- continuously rising administered costs (at significantly above inflation);
- persistently high rail freight and port charges and inefficiencies;
- serious infrastructure constraints (increasingly at a municipal level); and
- if imports, a significant proportion of which are illegal, continue to grow at or beyond existing levels.

More critically, the outlook for the country has over the past few years been diverging from the broader global outlook. Illustrating the point, the IMF's World Economic Outlook has suggested that South Africa is facing the possibility of sustained slow growth for a number of years.



Obviously, a key - and not unreasonable - assumption of the IMF forecast is that commodity prices continue to recover only slowly. Current commodity price movements suggest that this may be unduly pessimistic and that the upturn may be sustained over the medium term. If this turns out to be the case – though it is always unwise to bet against re-emerging volatility - faster mineral commodity price growth will of course benefit SA.

But in the absence of structural change these benefits will be muted over the short term and temporary at best, still leaving South Africa well adrift of current world - and especially most middle-income country - growth trends.

As set out repeatedly in other sections of IPAP 2018, South Africa will need to develop a much more tightly-coordinated and supportive environment – premised on policy and programmatic certainty, principled stakeholder collaboration, state and SOC institutional renewal and a sustained war on rent-seeking, corruption and collusion, whether public or private.

These will represent the first indispensable steps on the path towards the deep-rooted structural change that all agree in principle to be vital; laying the necessary platform for strong and sustained private sector investment, job creation and an inclusive growth path.

A welder is working in a factory, creating a large shower of bright orange sparks that fall from the welding point. The sparks are dense and bright, illuminating the scene. The welder is wearing a blue shirt and a green safety cap. The background shows a cluttered industrial environment with various tools and equipment.

10 YEARS OF IPAP: A LEGACY REPORT

Overview

Looking back over the first ten years of IPAP, we can draw up a high-level balance sheet of successes and failures, areas of excellence achieved, and areas where interventions were blocked or slowed by external and internal headwinds and structural constraints.

We can point to significant areas of achievement at scale in various sectors – most notably, in Automotives, Clothing, Textiles Leather and Footwear (CTLF), Business Process Services (BPS), Film Production and Boatbuilding.

But none of these successes would have been achieved without the creation of a platform of cross-cutting and sector-specific interventions, including:

- industrial financing;
- the deployment of conditional incentives;
- local procurement and the offset programme the National Industrial Participation Programme (NIPP); and
- a wide variety of demand- and supply-side industrial policy levers designed to secure higher levels of investment and raise the competitiveness of the productive sectors of the economy.

The latter include:

- developmental trade policies; including the technical infrastructure institutions which support the industrial effort;
- efforts to stem the tide of illegal imports, working with Customs;
- technology support measures; and
- competition policy (which addresses anti-competitive behaviour and lowers barriers to entry).

These are some of the basic elements of the industrial toolkit that government has developed over the successive iterations of IPAP, following a 'learning-by- doing' approach.

But the conditions have been very difficult throughout.

The implementation of IPAP coincided with the global financial crisis, whose effects rippled through the SA economy from 2009 onwards and were compounded by the tapering of the commodity super-cycle and subsequent fall in demand for commodities (as China adjusted by rebalancing its policy, with strong adverse effects on South Africa's commodity exports).

The total economy shed 1 million jobs, with the manufacturing sector losing almost 320,000. Only those subsectors that are less sensitive to boom-bust economic cycles created jobs over this period. But it is important to note that government's resolute counter-cyclical industrialisation efforts arrested the scale of job losses during this period, preventing potentially catastrophic full-scale deindustrialisation.

In the face of very stiff global and domestic headwinds, the manufacturing sector was able to weather the worst of the Great Recession and its lingering low-growth aftermath. While the share of manufacturing value-added to total GDP declined from 15% to 13%, (which was a trend experienced by many developed and developing countries) manufacturing value-added in real terms grew from R338 billion in 2009 to R383 billion in 2016. This was led by sectors such as food and beverages, automotives, chemicals and plastics, averaging 2% annual growth.

Over the 10-year IPAP period, manufactured exports have grown four-fold, while imports have doubled. South Africa's exports of manufactured goods were dominated by metals, metal products, machinery and equipment, (including capital equipment and mining machinery and equipment).

Although manufactured imports remained higher than exports in real terms – thereby resulting in a trade deficit for manufacturing as a whole - significant diversity in the trade performance of different manufacturing sectors and sub-sectors has been reflected in the trade data. Overall growth has also been bolstered by robust growth in manufactured exports to Africa, where the trade balance shows a strong surplus.

Overall, the evidence to date suggests that industrial policy succeeds under the following circumstances:

- Where it is properly targeted and well designed, with strong oversight and continuous upgrading;

- Where it is the subject of a collaborative engagement and agreement with the private sector and labour and where public-sector support requires reciprocal conditions from social partners;
- Where it is adequately resourced;
- Where institutional failure (driven by corruption and rent-seeking) have been held at bay and policy coherence and programme alignment achieved in support of the industrial effort;
- Where coherent coordination efforts have been developed to create the conditions for an orderly transition to a less carbon- and more technology-intensive industrial economy;
- Where there is common cause that innovation and dynamism is required across government to ensure that developmental regulatory frameworks support the industrialisation effort.



SECTORAL RECORD

1. Automotive sector

In the face of very stiff competition from other national production centres, SA has maintained a world class automotive production capability, with significant support from the state in an ongoing collaborative arrangement with global OEMs, component manufacturers and labour.



33% mnf. GDP

R171 bn exports

6% total GDP

113,000 jobs

The sector contributes 33% to manufacturing GDP and about 6% to overall GDP. It produces approximately 600,000 vehicles per year, /supporting 113,000 jobs. Exports have doubled in this period, which has also seen R45 bn worth of investment by the majority of the world's leading global vehicle manufacturers – MB, Toyota, VW, BMW, Ford, BAIC, BAW, Isuzu etc.

As part of the ongoing effort to sustain SA's competitive capabilities in this sector **the dti** has developed an Automotive Masterplan 2020, working together with the automotive companies, component suppliers and labour, to ensure that SA retains and grows its automotive sector, is able to continue to compete with other national jurisdictions for production platforms, grows its exports and secures higher levels of empowerment across the sectoral value chains.

This record contrasts sharply with recent developments in some other countries. The significance of this achievement cannot be underestimated – particularly in terms of the economic and employment multipliers that derive from it and the many spillover effects that it generates: technology absorption, new skills and industrial capabilities.

2. Clothing, Textiles, Leather and Footwear sector

In the wake of the devastation of the sector that followed from the liberalisation and restructuring of the industry in the 1990s (with approximately 120,000 jobs lost) over the past decade the sector has been saved from extinction and stabilised. As a result of the conditional support measures offered under the Clothing and Textile Competitiveness Programme (CTCP) the sector now employs 95,000 workers, contributing 8% to manufacturing GDP and 2.9% to overall GDP. In the leather sector 22 new factories have been opened, supporting 2,200 jobs.



8% mnf. GDP

R24 bn exports

2.9% total GDP

95 ,000 jobs

Manufacturing value addition for companies receiving the incentive has grown by 60.8%, and productivity by 22.3%. Two national and eight regional clusters have been established, providing a platform for cooperation between government, labour and the textile and apparel manufacturers and retail value chains. This has allowed for the development of a robust market in fast-turnaround, quick fashions items.

However, no industrial policy sector strategy can afford to be static in the face of rapidly evolving and dynamic market conditions, massive increases in productivity and continually intensifying global competition. With this very much in mind, **the dti** has recently launched a wide-ranging collaborative study with all the relevant sectoral players to raise competitiveness, deepen localisation and support job creation across the value chain.

3. Agro-processing

The agro-processing sector has been identified as one of the critical sectors earmarked for special attention under the Presidential Nine-Point Plan. The core issue here is to defend and expand the agricultural and agro-processing value chain as a key provider of labour-intensive growth. (It currently employs around 283,000 people, contributing 20.3% to manufacturing GDP and 2.7% to total GDP).



20.3% mnf. GDP

R50 bn exports

2.7% total GDP

283,000 jobs

Since 2009, **the dti** has supported agro-processing industries to the tune of R1.2 billion through various incentive schemes. The sector also benefitted from total investments of around R7 billion, both by multinationals and local players. The next step – as a direct response to the 9-Point Plan – was taken in 2017, with the launch of R1 billion Agro-Processing Support Scheme (APSS), aimed at further ramping up investment and value-addition across the sector.

Over the past 5-year period significant investments have taken place in this sector. Summary numbers were as follows: FABCOS/**the dti** – R1.2 billion; Nestlé - R1.2 billion; Tiger Brands - R1 billion; Unilever - R600 million; P G Bison - R600 million; Dursots-All Joy - R100 million; GWK Farm Foods - R400 million; Astral Foods/**the dti** - R200 million; Coega Development Corporation/**the dti** - R86 million; R420 million in investment projects aimed at emerging farmers in the deciduous fruit industry; and **the dti**/IDC support for 6 new small-scale maize mills

4. Metal fabrication, capital & rail transport equipment

The metal fabrication, capital & rail transport equipment as a cluster of industries forms a very important component of local manufacturing. Over the years South Africa has developed niche capabilities in areas such as capital and rail transport equipment and structural steel, but recent years have seen stagnation and/or decline in key sub-sectors like casting, tooling and foundries.



16.7% mnf. GDP

R 212 bn exports

2.2% total GDP

31, 404 jobs

In an effort to turn this trajectory around, government and industry players came together to develop the National Tooling Initiative (NTI) and the National Foundry Technology Network (NFTN) – initiatives targeted at increasing the competitiveness of these sectors through critical skills development and job creation programmes, technology development and adoption, enterprise development and export promotion.

This led to the development of a skills pipeline comprising more than 1,800 students over 4 cycles - with 98% of students from previously disadvantaged communities, 30% females, and above average learner-retention rates. All programme participants received on-the-job training, resulting in more than 80% of toolmaker students finding permanent jobs.

Three Centres of Excellence (Western Cape, Pretoria and KwaZulu-Natal) and two Trade Test Centres (Pretoria and Western Cape) – all with state-of-the art equipment - have also been established. In parallel, upwards of 100 Tool, Die and Mould (TDM) companies have been supported through the Enterprise Development Programme.

Under the NFTN umbrella, a total of 44 foundries have so far been assisted through the Competitive Improvement Initiatives (CII) Programme, with interventions ranging from baseline assessments to technology-transfer, lean manufacturing and energy management. 32 foundries were also assisted with technical and regulatory support interventions. Also included was help with acquiring accreditation for Quality Management Systems, Pressure Equipment Directive (PED) and Atmospheric Emission Licences (AELs).

Through the Scaw Metals supplier development programme, local foundries will be able to supply coupler components to Transnet. Other successes achieved through this programme over the review period include:

- Industrial Valves Manufacturers – NFTN supported five foundries (Duvha Foundry, Forbes Foundry, Hi Alloy Foundry, Active Foundry and GE Patterns) selected by IVM (OEM) to supply wedge gate, butterfly and nozzle check valves (previously imported products) for Vaal Gamagara Water Supply Scheme (Sedibeng Water Pipeline)
- Transnet Engineering Tender (MicroValve)- supply and manufacture of 250 valves (relieve valves, cut-out cocks and auto-drain valves) for use in the assembly of locomotives. Microcast and Dhuva foundries will be used to cast these valves.

The other major area of IPAP intervention in the sector has been the leveraging of procurement for both freight and passenger rolling stock through designation of systems and products under the PPPFA.

Locomotives, wagons and coaches for freight and commuter rail were amongst the top ten identified large and strategic procurement fleets.

On the back of these designations, PRASA issued a tender for the procurement of 3,600 new coaches (600 train-sets) in 2012. The contract was awarded in 2014 to Alstom-Gibela and includes a Manufacture Supply Agreement (MSA) for 10 years and Technical Support and Spares Supply Agreement (TSSSA) for 18 years.

This contract is expected to deliver 5,256 coaches to satisfy existing rail passenger demand on the current network until the year 2020; 456 vehicles to satisfy growth in rail passenger demand to the year 2030 on the existing network; and a possible further 1,512 vehicles to satisfy long-term rolling stock needs on new corridors to be constructed as part of future expansion of the existing network and the development of a new network.

In 2013, Transnet Freight Rail (TFR) issued a tender for the procurement of 1,064 locomotives, with the contract being split in 2014 between four OEMs. The contracts stipulate minimum local production and content thresholds of 55% for diesel locomotives; 60% for electric locomotives; and 65% for passenger coaches.

Over 60 companies in the sector are currently benefiting from the TFR & PRASA contracts, either directly (in the case of OEMs) or indirectly (in the case of Tier-1 suppliers).

Notwithstanding issues related to import leakages and shortcomings with respect to supplier development, the efforts to rebuild SA's rail industrial capabilities have begun to meet with some success.

The following rail sector company launches or expansions in 2017/18 may be summarily noted:

Morgan Advanced Materials (electric carbon components); ABB Modderfontein (traction transformer factory); Electro-Inductive Industries/Siemens (transformers); Lucchini (railway forged wheels); Timken (train wheel bearings); Transnet Engineering (the SA-

designed Trans-Africa Locomotive); PRASA's Dunnotar Park facility (train manufacturing); Koedoespoort assembly plant (locomotive assembly for Transnet Freight Rail and General Electric); Bombardier Transportation South Africa (BT) and CRRC Dalian Locomotive & Rolling Stock (new-build locomotives currently undergoing trials and test runs).

5. Steel Industry

The onset of the steel crisis in late 2014 saw SA's dominant steel producer, ArcelorMittal South Africa (AMSA) approach government for support, demonstrating a willingness to engage on legacy battles related to pricing and investment. For government, the targeted outcome is an optimal 'end state' of a viable, competitive and sustainable steel industry in SA, balancing support as far as possible between the interests of both upstream and downstream players.

The problems of the SA steel industry are not unique. Countries around the world are grappling with a continuing steel crisis characterised by massive global excess capacity, exacerbated by weak economic recovery and depressed market demand. In South Africa and the region, the effects have been severe as iron-ore mines, primary steel mills and manufacturers struggle to compete, retain jobs and invest.

As also happened in a number of other jurisdictions such as the EU, India and the USA, the SA government intervened to save the industry from the threat of collapse, with all its attendant consequences in terms of skills and capacity losses. The first support measures put in place were a) increasing the general rate of customs duty on primary steel products to 10%; b) increasing the tariff on a range of downstream products; and c) the deployment of various rebates. A Steel Development Fund of R1.5 bn was also established to support key downstream steel sectors/sub sectors.

Agreement was also reached with AMSA on a set of principles for appropriate flat steel pricing in SA to ensure that both upstream steel mills and downstream steel-dependent industries remain competitive and sustainable.

To further increase industry competitiveness, government retracted the deeming of primary steel in designated products (requiring the use of locally manufactured primary steel) and designated downstream steel-intensive construction steel products and components. This

meant that all steel would be sourced locally.

The level of coordination between the Economic Development Department (Competition, Trade, Industrial funding, and Social Dialogue) and **the dti** (industrial incentives, local designation, tariffs and business coordination) was extensive, and an example of joined-up government that yielded positive results.

The G20 and OECD Steel Committee recognised SA's exemplary policy intervention during the steel crisis, noting that it was implemented with good social dialogue between government, industry and labour.

An independent process under the Competition Commission resulted in a R1.5bn fine and R4.6 bn investment commitments by AMSA.

6. Plastics and Cosmetics Sector

6.1. Plastics

The downstream plastics sector is largely comprised of small firms, due to the relative ease of entry in the industry. The sector as a whole has been growing at an average rate of 3-5% annually for the past 10 years. Its current contribution to manufacturing GDP is 14.5% (1.9% of overall GDP) – with plastic packaging the largest contributor.



14.5% mnf. GDP

R24 bn exports

1.9% total GDP

60,000 jobs

Total investment under the period of review is approximately R7.5 billion, which includes both newly-formed companies and expansions to increase capacity to satisfy the growing demand for polyethylene polymers.

The downstream industry, which tends towards greater labour-intensity, has shown steady employment growth, with employment by plastic fabricators having risen to roughly 60, 000 – nearly double the number for 2007 (38,000). This growth is

also contributed to by the chemicals sector's promotion of downstream fabrication of polymers, which requires far more competitive pricing of polymer inputs, skills development, support for firm and industry level technical capabilities such as R&D and tooling, and stronger matching of final product demand patterns to intermediate plastic inputs.

Aside from legitimate international competition, the domestic economy has over recent years witnessed significant penetration by illegal imports. In response, **the dti**, SARS and the industry coordinated efforts to design and implement a risk engine to combat customs fraud and under-invoicing at customs. The initiative – which is already showing strong quarterly results - is aimed at encouraging and supporting local production of components to help the sector compete effectively and sustainably in the local market.

Some of the key company launches and/or upgrades/expansions in the Plastics Industry over the period include:

- Mpact Polymers (Polyethylene terephthalate recycling plant);
- SRF Flexi-Pack (biaxial-orientated polypropylene film manufacturing line);
- Sasol Polymers (R1.9 billion ethylene purification unit);
- KAP Industrial (4.1-billion acquisition of Sasolburg-based polypropylene and high-density polyethylene manufacturer Safripol);
- CSIR (development of 100% biodegradable plastic bags made from agricultural by-products).

Further worth mentioning was the establishment of the Nelson Mandela Bay Composites Cluster, with funding from the Cluster Development Programme;

6.2. Cosmetics

The sector contributes 1% to manufacturing GDP and employs 60,000 people in manufacturing, plus thousands of jobs in the services sector like hair salons, health spas and retail.

With the global natural ingredients and organic cosmetics sector growing rapidly, **the dti** has taken the initiative to support a wide range of companies in the value

chain. There has been a huge uptake of natural ingredients like Aloe *ferox*, marula, baobab, rooibos and Kalahari melon, and more than 549 products containing natural ingredients from indigenous plants are on the shelves.

Total revenue produced from value-added bio-products in the domestic retail market was approximately R1.5 billion in 2013. 70 % of these products are personal care and cosmetic products, with the remaining 30% being complementary medicine and food flavouring.

Most notable recent investments include the following:

- The Bespoke Amenities Company (TBAC) – which benefitted from an MCEP grant to expand its manufacturing facility in Johannesburg - now exports amenities (hotel lotions, liquid and bar soaps) to 18 African countries and services 3,500 clients.
- MCEP also provided support for AMKA's R900 million project to build and equip a new factory and warehouse extension.
- In 2013, Unilever officially opened a R1.4 billion Home Care factory that will increase production capacity by 67% from 90,000 to 150,000 tons annually.

7. Mineral Beneficiation

Government policy-making over the IPAP years has focussed with increasing intensity on the need to diversify away from mining and resource extraction towards a manufacturing, value-adding and job creating economy. Globally, resource-based economies have been finding it difficult to perform consistently because of commodity price volatility and a sharp decline at the tail-end of the commodity super-cycle. In South Africa, this tendency was clearly evident as mineral export prices dropped between 2011 (35%) to 2014 (26%), while gaining back some ground in 2015 (28%).

In this context, mineral beneficiation has been identified in IPAP as a key instrument for the industrialisation agenda. On the back of detailed research and collaborative work, South Africa is well poised to assume a globally comparative role in the hydrogen economy and energy storage space - with a number of key projects already being implemented by government, the IDC and the industry. Creating new demand for Platinum Group Minerals (PGM) has become a major objective, with fuel cells and energy storage technology

development at the leading edge. The developing fuel cell industry will also help to boost energy efficiency and carbon reduction.

Some projects that benefitted from government interventions include the SEZ Fund which provided catalytic funding to support the feasibility and demonstration of a world-class 100KW fuel cell at the Chamber of Mines (COM).

A number of other fuel cell initiatives have been launched. For example:

- Isondo Precious Metals acquired the rights to manufacture, use, market and sell licensed fuel cell components worldwide.
- Anglo-American set up a fuel cell project powering the Naledi Trust Community in Kroonstad, supplying 34 households through a 60kVA peak power fuel cell system delivered via a mini-grid.
- A demonstration fuel cell forklift with on-board metal hydride storage was developed by the DST's HySA initiative for Impala Platinum Refineries.
- The Black Industrialist Programme is supporting the commercialisation of a high-purity battery grade Nickel Sulphate (NiSO_4) from Lonmin's crude nickel sulphate stream. This has led to the establishment of a R251 million 25,000 t/a pure nickel sulphate plant in the NW.
- In 2013 IPAP identified the development and rollout of a Gold Loan Scheme to support jewellery manufacturers to buy gold competitively as a raw material. The Scheme was launched on 30 September 2014, with R100 million allocated under the Manufacturing Competitive Enhancement Programme (MCEP)'s niche funding scheme to support large jewellery manufacturers to finance gold for jewellery manufacturing.
- De Beers launched a diamond beneficiation scheme with five emerging diamond cutters and polishers.

8. Mining Capital Equipment

Highlights of the decade mainly centred on collaborative government/industry programmes and projects. The key stand-out Programme is described below.

In discussions with industry, a shared understanding was developed that for South Africa to once again assert itself as a centre of excellence for the development of goods and services in the mining sector, it had to actively rebuild its R&D capability. This resulted

in the establishment of the Mandela Mining Precinct, which is a partnership between the mining industry (Chamber of Mines) and government (DST, **the dti**, DPME) that is formally managing the implementation of the South African Mining Extraction Research Development and Innovation (SAMERDI) programme.

The Mandela Mining Precinct has been allocated an operational and capital expenditure budget for the next 3 years until it is self-sustaining, coupled with a significant contribution from industry. The Mandela Mining Precinct started operating in May 2016 and the CSIR moved its mining scientists to the facility, along with representatives from the Chamber of Mines, Mining Equipment Manufacturers of South Africa and **the dti**. The formal launch of the mining hub will take place in May 2018.

There are several R&D programmes and a supplier development initiative under way at the Mandela Mining Precinct and funding of R222 million has been allocated by National Treasury for the R&D programmes until 2021, specifically for project implementation. The Chamber of Mines has raised R33 million to fund the shortfalls in the five R&D project streams for 2018. In mid-2016 government also initiated the establishment of the Mining Equipment Manufacturers Cluster (MEMSA), which now resides at the Mandela Mining Precinct.

9. Business Process Services (BPS)

South Africa has positioned itself as a leading offshoring destination, expanding into broader BPO services and winning international recognition as a preferred customer service location. The international industry is now complemented by a thriving local market.

A strong government support base has facilitated exponential growth within the BPO/contact centre sector, which now employs an estimated 220,000 people across both the domestic and the international segments, with approximately 32,000 servicing international markets.

Over the period, the domestic market has grown at an average of 10.7% per annum since 2002, while the offshore/International market has grown at 26.7%.

In 2016, South Africa was named Offshoring Destination of the Year at the Global Sourcing Association (GSA) awards in London. It also received the NOA (National Outsourcing

Association)'s Offshoring Destination of the Year award in 2012, the European Outsourcing Association's (EOA) Offshoring Destination of the Year award in 2013 and the NOA Skills Development Project of the Year award in 2014.

Further recognition of South Africa as a major international BPS player is evidenced by the fact that the Global Sourcing Association has confirmed that South Africa will host its 2018 Summit.

The key instrument in leveraging achievements has been the BPS Incentive Programme. This was recently revised to include a condition that binds grant recipients to achieve 80% youth representation in their overall staff complement, thereby aligning the scheme with commitments made in the National Youth Accord.

In addition to the BPS incentive, **the dti** has also partnered with industry, the National Skills Fund and the Jobs Fund to prepare unemployed youth to work in the industry through the Monyetla Work Readiness Programme.

Since its launch in 2006, Monyetla – meaning “opportunity” in seTswana - has offered training grants to the industry and helped over 16,000 young people across the country to gain training through a model which guarantees commitment by the industry to employ learners post- training.

Some key sectoral progress indicators over the review period include the following:

- In 1998, Lufthansa became the first offshore operation to outsource to South Africa.
- Following this, South Africa expanded into other global BPO markets and is now home to operators including Aegis, Capita, CCI, EXL, Barclays, Conduent, Infosys, Genpact, Teleperformance, Webhelp and WNS. Capita, the largest UK outsourcer located in SA, has already created 2,300 jobs and will be creating an additional 1,200 over the next 12 months.
- SA is also the offshore destination of choice for International brands such as Amazon, Asda, Bloomberg, British Gas, Direct Line Group, iiNet, O₂, Shell and Shop Direct.
- The international industry is complemented by a thriving local market, which includes companies such as Old Mutual, Sanlam, Woolworths Financial Services, Discovery Health, The Foschini Group, Metropolitan Health Group and others.

10. Film sector

the dti has been supporting the film sector since 2004 through two complementary programmes - the South African Film and Television Co-Production Incentive and the Foreign Film and Television Post-Production Incentive.

Government support provided to the film and television sectors has been a major contributing factor in assisting these sectors to become firmly entrenched on the global stage for film and television production, whilst also providing strong support for local production and employment creation.

Since 2011/12, 574 productions (113 foreign, 461 local) have been approved under the Film Incentive Scheme, with a projected spending of R13 billion and the total value of claims paid by **the dti** standing at R2.1 billion. 249,641 direct jobs and 22,960 full time equivalent jobs have been created.

In 2014/15, **the dti** launched the newly-developed R1 million threshold South African Emerging Black Film-Makers Incentive Programme. The objective of the programme is evident from its title - support emerging black filmmakers to nurture and grow their talent from small movies to big productions, thus further contributing to skilled employment creation in the sector.

In parallel with this programme, the IDC and the National Film and Video Foundation (NFVF) launched the Emerging Black Filmmakers Transformation Fund (EBFTF) as a further support measure.

Over the years the two incentive schemes have facilitated the production of several 'blockbuster' movies in South Africa. For instance:

- *Mad Max 4 – Fury Road* (starring Charlize Theron and Tom Hardy). At US\$ 125 million, this was the biggest feature film to have been produced by Warner Bros in South Africa.
- Other major films include *Chronicle* and *Safe House* (starring Denzel Washington and Ryan Reynolds), the 3D comic-book adventure *Dredd* and the television drama *Mary and Martha* (starring Hilary Swank).
- *The Adventures of Zambezia*, a locally-produced animated feature film, has received outstanding accolades and nominations.

11. Green industries

As a first step towards reversing South Africa's historical dependence on fossil fuels for energy generation, government has pledged to peak, plateau and reduce the country's greenhouse gas (GHG) emissions over the coming decades – a commitment that will have major implications for the country's industrial and trade agenda.

In parallel, government realised that renewable energy generation could become a highly significant catalyst for industrial development and consumer benefit. A critical mass of renewable energy-generation projects can achieve a range of objectives including localisation of components, job creation and competitiveness improvement.

In an initial move to develop the country's renewable energy sector, government introduced the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) in 2012. The programme aims to develop South Africa's renewable energy sector through a competitive bidding process. At the present stage of development of the industry, all projects in Bid Windows 1 and 2, and 10 projects in Bid Window 3 are now operational.

6,422 MW of electricity have been procured from 112 renewable energy producers in seven bidding rounds, whilst 3,162 MW of electricity generation capacity from 57 IPP projects have been connected to the national grid.

16,991 GWh of energy has been generated by renewable energy sources procured under REIPPPP. Of the 57 projects that have reached commercial operation date, 44 projects have already been operational for longer than a year.

The total committed investment is R201.8 billion, of which REIPPPP has attracted R48.8 billion in foreign investment and financing. This created 32,532 new job years for South African citizens and has secured carbon emission reductions of 17.25 Mtonnes of CO₂.

It has also contributed to localisation objectives, with local content commitments by IPPs amounted to R67.1 billion, or 45% of the total project value of R147.6 billion for all the bid windows. Actual local content spend - where construction has already started - amounts to R38.1 billion.

11.1. National Cleaner Production Centre

- The National Cleaner Production Centre (NCPC), established in 2002, is a government programme that drives the country's transition towards a low carbon economy. Since 2013, 806 companies have been assessed, resulting in potential savings of R12.4 billion.

12. Marine manufacturing and associated services

The Marine Manufacturing Sector Programme, as defined in IPAP, encompasses support works in:

- boatbuilding/shipbuilding;
- ship and rig maintenance and repairs;
- manufacturing of marine components; and
- equipment industries in the upstream and downstream value chain.

The Marine Manufacturing Industry is at the core of economic growth, job creation, and transformation in the oceans economy. A total investment value amounting to approximately R26.2 billion has been disbursed in the Oceans Economy and over 6,545 jobs have been created in the various sectors.



0.2% mnf. GDP

R2.5 bn exports

R6.9 bn in investments

4,507 jobs

The Industry has secured R6.9 billion or 26.4% of total sectoral investment, creating 4,507 jobs (or 69.88% of the jobs created in the oceans economy).

Building on other recommendations flowing from *Operation Phakisa*, the dti embarked on an extensive engagement with industry which produced a comprehensive strategy, namely, *The Marine Manufacturing Development Plan* (MMDP).

It has now launched a sector development programme that has so far resulted in 5 tenders for new builds and 5 tenders for maintenance, advertised with a conditionality of 60% local content.

Furthermore, under the designation policy, approximately R3.42 billion in tenders (Navy, National Research Foundation, Transnet) was awarded to local companies. These included tenders to build workboat ferries and (in the biggest contract) the construction of a highly complex hydrographic survey vessel.

Other support provided through **the dti** incentives leveraged investments worth R503 million. Marine manufacturing performance has greatly improved, and industry exports increased by 174% between 2007 and 2016.

13. Aerospace & Defence

Several initiatives were developed over the period, in collaboration with Armscor, the Department of Defence, Aerospace Maritime and the Defence Industries Association. Notable outcomes have been building up the National Defence Council, the launch of a BBEE Charter and the launch of the Aerospace Industry Support Initiative (AISI), an initiative of **the dti**, hosted by the CSIR and closely aligned with key IPAP sectoral priorities and the jobs drivers of the *New Growth Path*.



AISI is a fully government-funded mechanism, and works across many sectors of South African industry, engaging with local players and international aerospace OEMs in support of the local South African aeronautics, defence and space industry.

As result of AISI's financial support, Daliff Precision Engineering (Pty) Ltd. is now on the Airbus Qualified Parts List (AQPL). The localisation project has led to import substitution and increased ability to supply local companies. Following a directive from EDD in support of the green economy, the IDC also played an important role. Other beneficiaries of the programme include TraX's and Aerosud. TraX's is now positioned as a supplier of Class-3 printed circuit boards (PCBs) to the aerospace and defence industries in South Africa, and as a preferred supplier of the SKA project, the national flagship astronomy programme.

AISI support also contributed to more international contracts being won by Aerosud and Denel Aerostructures with companies such as Airbus, Boeing and Spirit Aerosystems. SMMEs were involved in these projects and benefitted from technology transfer and process improvement.

The sector has also seen the unveiling of a range of significant new products, including:

- a new generation 8x8 infantry combat vehicle;
- the Advanced High-Performance Reconnaissance Light Aircraft (Ahrlac);
- the lightest 7.62 mm general-purpose machine gun in the world;
- the Falcon 402 single-engined passenger and utility aircraft, and
- the design and build of a nano-satellite in South Africa, launched from the International Space Station as part of the European Commission's research project.

14. Electro-technical Sector

The Electro-technical sector is divided into Information and Communications Technology, Electronics and Electrical Engineering, including White Goods. Each of these is in turn made up of various sub-sectors with their own areas of specialisation.

In 2008, as part of its on-going effort to sustain competitive capabilities across the sector, **the dti** developed a Customised Sector Program (CSP) to support its growth, create global industry awareness of South African electro-technical capabilities and assist contract manufacturers to get access to large-scale contracts from multinational corporations.

It is also aimed at promoting job retention and growth in the South African television manufacturing industry, increasing competitiveness and quality in software development, expanding the domestic manufacturing base in the White Goods industry and increasing SA's production capacity in Compact Fluorescent Lamps within SACU.

Considerable success has been achieved in most of the areas above, as illustrated by the following achievements since the implementation of the CSP:

- In 2011, in terms of the regulations of the PPPFA agreed between **the dti**, National Treasury and EDD, designation of set-top boxes was set at 30% local content, electrical and telecom cables at 90%; residential prepaid electricity meters at 70%; post-paid meters at 70%; smart meters at 50%; water meters at 40% and two-way radio terminals at 60%.

- UI Cables, based in Alberton, launched a new R100m cable manufacturing plant. This 90% black-owned company - which manufactures specialised cables for clients in the energy, transport, communication and mining sectors - has received R46 million in support from **the dti**, through the Black Industrialists Incentive Scheme. UI will produce a wide range of copper cables including optical ground wires.
- Now in its fourth year of operation, Hi-Sense South Africa produced both its one-millionth television set and its one-millionth fridge at its local manufacturing facility in Atlantis, Western Cape.
- Whirlpool South Africa invested R100 million in the Isithebe Industrial Park near Mandeni - recently upgraded by **the dti** - where it manufactures KIC refrigerators and freezers and other home appliances for the SA white goods market. 1,000 jobs have been retained and 100 new jobs created. A skills development programme is to be put in place, together with the creation of an integrated local supply chain.
- **the dti** - in partnership with the South African Electrotechnical Export Council and the four leading white goods OEMs - Defy SA, Hi-Sense, Whirlpool and Zero Appliances - established the White Goods Manufacturers Cluster. The partnership seeks to position South Africa as a leading exporter of locally manufactured white goods, especially to the African continent.

TRANSVERSAL RECORD

1. Procurement

1.1. Designation

From its first iteration, IPAP has identified public procurement as a key lever for industrialisation and re-industrialisation, by raising aggregate domestic demand through the promotion of local production and an aggregate increase in the productive sectors' share of production and employment.

A review of the technical specification SANS 1286:2017 was carried out in 2017. The specification provides the standard definition of local content - expressed as a percentage of the tender price and primarily based on local manufacturing. Bidders are therefore compelled to use the standard formula in calculating their local content.

To date, a total of 23 sectors/products have been designated for local production, with varying minimum local content thresholds. Below is a table with all the designated sectors/products thus far.

Table 1: Sectors/products designated for local production in public sector procurement

#	Sectors already designated * Category/description	Minimum local content thresholds
1.	RAIL ROLLING STOCK	
	Diesel locomotives	55%
	Electric locomotives	60%
	Electric multiple units	65%
2.	Wagons	80%
	Bus bodies	from 70% -80%
3.	Canned/processed vegetables	80%
4.	Clothing, textiles, leather & footwear sector	100%
5.	Solar water heaters (tank & collector)	70%
6.	Set-top boxes	80%

#	Sectors already designated * Category/description	Minimum local content thresholds
7.	Certain pharmaceutical products	Per tender
8.	Furniture products	from 85% - 100%
9.	Electrical and telecom cables	90%
10.	Valves and actuators	70%
11.	Working vessels	60%
12.	Residential electricity and water meters	from 50 to 70%
13.	Steel conveyance pipes, pipe fittings and specials	from 80% to 100%
14.	Powerline hardware and structures	100%
15.	Transformers	From 10% to 90%
16.	Two-way radios	60%
17.	Solar PV components	From 15% to 90%
18.	Rail signalling system	65%
19.	Wheelie-bins	100%
20.	Fire Fighting Vehicles	30%
21.	Steel Products and Components for Construction	100%
22.	Rail Permanent Way	90%
23.	Pumps & MV Motors	70%

Source: **the dti**

Between 2015 and July 2017, almost R59.95 billion was reported to **the dti** as value for local content in public procurement. The major transaction was on the rail rolling stock fleet procurement, amounting to about R49.5 billion.

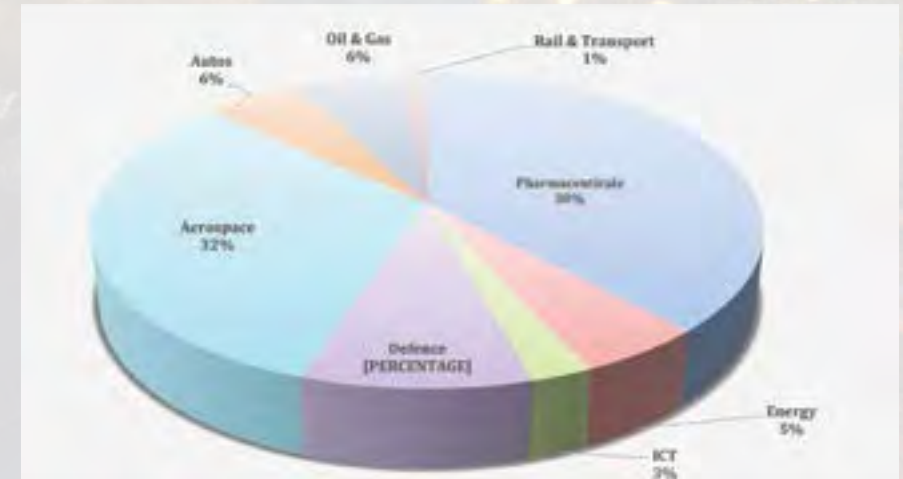
However, the challenge remains the verification of the *real achieved value*. SABS has been given an urgent mandate to step up its efforts to carry out accurate and trustworthy local content verifications.

the dti has conducted over 155 training workshops since July 2012. On Regulation 9.3 (2011 PPPFA Regulations) and Regulation 8.4 (2017 PPPFA Regulations), 43 bids utilised these provisions in the absence of designated products to ensure localisation.

1.2. National Industrial Participation Programme (NIPP)

The NIP secretariat is currently managing a range of obligations estimated at R18 billion in total, to be fulfilled over the next 7 years. Apart from this, it is also negotiating obligations arising from the pharmaceutical industry which are estimated at R10 billion.

Over the period, the programme has attracted obligations across sectors including Defence, Oil and Gas, Automotive, Aerospace, Rail, Energy and ICT. The chart below reflects the spread of obligations across the sectors and their relative size, as a percentage of the total NIP obligations (R28 billion) currently being managed and negotiated.



Source: **the dti**

182 local companies have been supported to improve their competitiveness and to increase their export capabilities. This has been done either through funding,

technology transfer or linking local players with the global value supply chains of OEMs. Investments have been attracted to a value of R3.8 billion, for both capital equipment and technology transfer, creating approximately 594 new direct jobs.

The focus of NIP projects remains the creation of company capabilities in maintenance, repair and overhaul, with a strong emphasis on transfers of equipment, tools and technological know-how from obligors and certification (including personnel training) to meet European standards. Specific support has also been given for the manufacture of aerospace composite components.

Apart from negotiating these NIP obligation agreements, the business unit has concluded agreements on the following stand-out projects:

- **the dti** reached an agreement with an obligor to provide a full suite of Product Lifecycle Management (PLM) software to the CSIR. This will enable the CSIR to support SMME development through the various product lifecycle stages. It is estimated that 2,000 companies will be supported over a seven-year period.
- Moipone-Marce JV has committed to investing approximately R10 million in a production facility in Centurion that will produce four components for fire-fighting trucks, increasing local content from a designated threshold of 30% to an average of 70% per truck.
- Cargotec has committed to investing approximately R15 million to expand the manufacturing capacity of CZ Electronics Manufacturing (Pty) Ltd in Boksburg. The investment will be used for the acquisition of the necessary equipment to set up production lines for local manufacture of open-view decoder boxes and affordable television sets.
- Huawei has committed to investing R2.1 billion to establish a Joint Innovation Centre (JIC) in South Africa. The centre will focus on developing technologies and software modules for both the domestic and international markets, including 4.5G/5G for the cellular phone industry, smart home solutions, mobile money technologies and application platforms for high-end smart phones.
- Hewlett-Packard (HP) has committed to investing R30 million in a South African Company, Ideco, to design and manufacture an electronic device that consists

of personal computer, camera, scanner and fingerprint reader for both local and export markets. The device is specifically designed for voter registration, management of elections and security services.

1.3. Proudly SA / Localisation

Since re-modelling itself to give priority support to IPAP sectors, *Proudly SA* has rolled out sustained campaigns on “buying Local” and consumer education for the public and private sectors. Its growing database of local products and services demonstrates that the campaign has begun to play a crucial role in opening market access for locally manufactured products. Since the re-launch of the database on 1 April 2017, company membership has increased to 1,130, with the number of items being promoted totalling 9,700.

In its support for the local manufacturing sector, *Proudly SA* has concluded localisation partnerships with several companies in the retail sector (including Edcon, Massmart, Foschini and others). Through its “Buy Back SA” campaign consumers and businesses are encouraged to make local procurement decisions to allow more money to flow back into the domestic economy.

The EDD has also pursued a range of initiatives to support local procurement, including agreements with Edcon and Massmart and dialogue with other retailers. The Massmart and Edcon agreements were incorporated as conditions in Competition filings. A Local Procurement Accord was developed with the support of social partners.”

2. Industrial Financing

Industrial financing is available via incentives administered by government departments and loans / equity facilitated through development finance institutions. **the dti** is a major provider of industrial incentives. The industrial Development Corporation, under the direction of the Minister of Economic Development, has greatly expanded the level and range of industrial funding, with an investment approvals target for the IDC, set by EDD, of R100 billion over five years. This support from the IDC / EDD is a critical element of the resourcing of IPAP at firm-level.

2.1. Incentives

One of the most effective **dti** contributions in support of broadening economic participation, inclusive growth and job creation has been its continuous provision of incentive packages. From 2011/12 to January 2018, the department stimulated and facilitated enterprise and industrial development by supporting 14,226 enterprises through various incentives totalling some R61 billion. These were mainly targeted at investments in plant, machinery and equipment, export marketing activities and the acquisition of business development services.

In a highly competitive global economy, incentive support to local and foreign investment is paramount for achieving business and economic growth. Incentive approvals have resulted in projected investment of R326 billion and the creation of an estimated 670,994 new jobs.

Over the past 7 years, the department's incentives have impacted profoundly on corporate behaviour in the various supported sectors. The first major initiative of this type was the Manufacturing Competitiveness Enhancement Programme (MCEP), launched in 2012. Through the MCEP, local manufacturers were able to discard obsolete and antiquated machinery and equipment for new investments valued at R30 billion in both production assets and competitiveness improvement measures.

This was later followed up by three major sector-specific incentives:

1. The Automotive Incentive Scheme, which helped secure investment commitments of over R45 billion by auto assemblers and component suppliers, retaining 38,267 jobs.
2. The Aquaculture Development Enhancement Programme - which issued its first approvals in March 2013 – and was designed to encourage the geographic spread of aquaculture development beyond the established Western Cape region. ADEP has achieved this objective with approved projects valued at R254 million in Gauteng, Mpumalanga, KwaZulu-Natal, North West and Limpopo.

3. The Business Process Services (BPS) Incentive has projected the creation of 43,657 jobs, 80% of which are going to employees under 35 years. The revised BPS incentive (implemented in October 2014), has reported over R24 billion in projected export revenue.

During 2015/16, **the dti** diversified its strategy by supporting the development of new products and processes through incentives such as the Technology and Human Resources for Industry Programme (THRIP), which attracted the involvement of 223 students from various universities across the country and a number of small, medium and micro enterprises innovating from their premises. THRIP promotes collaboration between government, industry and higher education institutions to produce technology solutions and the appropriate highly skilled human resources to implement them.

The 2015/16 financial year also saw renewed support for state-owned industrial parks under the Critical Infrastructure Support Programme, which leverages investment by supporting infrastructure upgrades and lowering the cost of doing business. Supported Industrial parks received R240 million and are located in the Free State, Gauteng, Limpopo, Mpumalanga and North West.

2.2. Black Industrialists Scheme (BIS)

In November 2015 government launched the Black Industrialist Scheme, aimed at supporting the emergence of committed black industrialists rather than merely transferring ownership in existing large companies to empowered individuals without any real change in decision-making and control.¹

The programme – which has benefited from specifically targeted funding earmarked by the IDC² and the National Empowerment Fund - has provided support through measures such as access to finance, access to markets, skills development, standards, quality and productivity improvements.

¹ For BIS qualifying criteria, see the footnote in the Minister's Foreword, p.4.

² For further elaboration of IDC funding and impacts on employment, see next section.

Figure 1. Actual /projected IDC funding for black-empowered / black-owned companies 2013-2017



Source: IDC Integrated Report 2017

To date, incentive grant support has been approved for 79 projects to a total value R1.9 billion, leveraging R7.2 billion in private investment. (See Table 1 below).

Table 1. Sectoral funding under BIS, with investments leveraged

Sector	the dti Grant	Investment leveraged
Plastics and pharmaceuticals	R567 million	R1.9 billion
Agro-processing	R316 million	R1 billion
Metals	R279 million	R1 billion
Electronics	R98 million	R600 million
Pulp and paper	R123 million	R524 million
Green sector	R149 million	R473 million
Manufacturing logistics	R116 million	R328 million
Automotives	R93 million	R268 million

Sector	the dti Grant	Investment leveraged
Clothing and textiles	R102 million	R238 million
Oil and gas	R101 million	R236 million
Mineral beneficiation	R50 million	R208 million

Source: the dti

It is estimated that this will result in the retention of 7,999 jobs and the creation of 9,459 new jobs.

Projects approved under the Black Industrialists Scheme include:

- K9 Pet Foods in the agro-processing sector, based in the Western Cape;
- Maneli Pets in the agro-processing sector, based in Gauteng;
- Dursorts Group in the agro-processing sector, based in Limpopo;
- Microfinish in the automotive sector, based in KwaZulu-Natal;
- United Industrial Cables in the industrial infrastructure sector, based in Gauteng;
- Mthembu Tissue in the pulp and paper sector, based in KwaZulu-Natal.

2.3. Industrial Development Corporation



Over the 10-year review period the Corporation increasingly focused its efforts on implementing a funding strategy closely aligned with key IPAP sectoral priorities.

From 2007 to March 2017, R91.7 billion of the value of IDC's funding for South African businesses went to industries currently prioritised in IPAP. This represented 81% of total IDC funding in South Africa over the period.

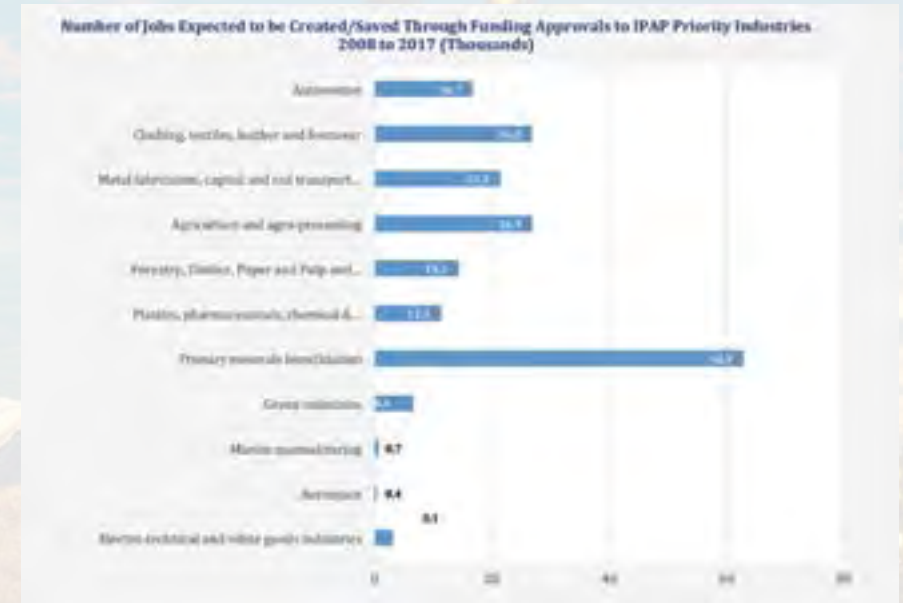
As can be seen in the following graphic, the primary minerals beneficiation industry attracted the largest portion of IDC funding; the rationale being that, despite its capital-intensity, it has several important linkages with the rest of the economy and provides a cornerstone for other manufacturing industries to build on. It also contributed to the largest number of jobs expected to be created through IDC funding (62,900).



Source: the dti

The IDC also played an important role in support of the renewable energy programme, resulting in green industries receiving the second largest portion of funding. (See above). Its participation in these industries included funding for renewable energy generation projects, sectoral component manufacturing and additional funding to assist companies to become more energy-efficient.

As the graphic below illustrates, apart from primary minerals beneficiation, the largest job numbers were recorded in the clothing, textiles, leather and footwear and the agriculture and agro-processing industries. Downstream metals industries such as fabricated metals and the motor vehicle industry also contributed large numbers of jobs.



Source: the dti

3. Innovation and technology

3.1. TECHNOLOGY INNOVATION AGENCY (TIA)



Over the past ten years the Department of Science and Technology (DST) has focused on the creation and strengthening of new entities to serve as innovation, technology transfer and commercialisation support structures. The aim has been to enable the translation of an even greater number of innovative ideas into prototypes for further commercial and industrial development.

Beginning in 2008, this entailed the conceptualisation and establishment of the Technology Innovation Agency (TIA) by 2010. Today, TIA continues to be tasked with the primary responsibility of maturing technologies with industrial potential between Technology Readiness Levels (TRLs) 4 to 7. To this end, TIA's mandate is to enable and support technological innovation across all sectors of the economy to deliver socio-economic benefits for South Africa and enhance its global competitiveness.

This is achieved by supporting the development and commercialisation of research outputs from Higher Education Institutions (HEIs), Science Councils (SCs), Public Entities and private research institutions. (Bringing ideas to market).

Over the past four years (2013/14 to 2016/17) the outcomes of some of TIA's ongoing initiatives have begun to bear witness to its growing impact within a maturing national system of innovation (NSI).

This has included the disbursement of a total of R1.6 billion to support new technological developments; the emergence of 205 new knowledge innovation products (i.e. protectable intellectual property (IP) and technology demonstrators). TIA has also provided technical support to over 8,550 SMMEs to further develop and commercialise their products and services. It is very encouraging to see that a number of technologies supported by TIA have proved attractive in both local and international markets; by the end of the 2016/17 financial year, 44 technologies had already successfully penetrated markets).

Overall, between 2013/14 and 2016/17, TIA funding and support activities resulted in the achievement of an economic multiplier effect of 3.38 - meaning that for every Rand that TIA spends, an equivalent of R3.38 of economic activity is achieved. (This compared with 2.87 in the 2010/11 financial year). This has resulted in a contribution of R4.48 billion to the national economy and to the creation of 14,022 jobs.

3.2. TECHNOLOGY COMMERCIALISATION HIGHLIGHTS

CSIR veterinary pathogen screening technology: TokaBio

TokaBio is a spin-out company that was set up in 2017 to focus on veterinary health and point-of-care diagnostics for control and management of Foot and Mouth disease (FMD). It emanated from the Molecular Diagnostics group within Biosciences, whose objective is to commercialise its developed technologies. Its assays, tests and analyses in the field of FMD are already proving worthwhile for other countries, where these diseases are endemic – in particular, Rwanda and Zambia. It is therefore conceivable that the commercialisation strategy may include these two countries as early adopters.

Further highlights on this technology

- The Zambian Ministry of Agriculture - with whom CSIR collaborates through the Zambian Central Veterinary Research institute (CVRI) - requested the CSIR team to assist with the epidemiology of their two most recent FMD outbreaks. This was the first time that such depth of information was collated for an FMD outbreak in Zambia.
- The July/August FMD outbreak in Rwanda prompted an invitation by the Rwandan Ministry of Agriculture to the Molecular Diagnostics Group of the CSIR to participate in control and scientific analysis of the situation.

Development of research reagents based on SA's biodiversity:

CapeBio Important research work is currently being developed on Protein and Enzyme Reagent (PER) technologies, with an emphasis on molecular biology reagent enzymes isolated from the Kogelberg Biosphere Reserve. The aim is to develop and commercialise market-ready technologies for recombinant production of protein and enzyme reagents in response to market needs. In addition, the team aims to create new PER bio-manufacturing licensing opportunities and spin-out companies for commercialisation of the recombinant reagent protein portfolio.

End-user testing of one product prototype has been completed; and expanded fully branded and packaged beta-testing of an advanced prototype is ongoing. In the first year, further effort was invested in enhancing the underpinning technology platform. These platform enhancement activities have resulted in a strong IP-base for the initiative and have resulted in the identification of several additional enzymes for further development in the coming years.

Licensing of Nutri-drink to Elvema

In 2015, a project to produce a commercial version of Nutri-drink (a nutrient-dense drink formulated from indigenous South African plants) was initiated, in a partnership between the National Food Technology Research Centre (NFTRC) in Botswana and Elvema Nutrition (Pty) Ltd. The commercialisation project was funded by SANBio-BioFISA, and the product launched in South Africa in March 2018.

3.3. HIGHLIGHTS: SUPPLY-SIDE RDI INTERVENTIONS

Enterprise Creation for Development (ECD) Furniture Manufacturing Hub (FMH)

During 2016 and 2017, ECD undertook a project on behalf of **the dti** to identify possible interventions that could upgrade the productivity and competitiveness of small-scale furniture manufacturers.

The agreed outcome was the establishment of a Furniture Manufacturing Hub, which would incorporate a business incubator and shared manufacturing facilities to deliver a comprehensive package of business development support services. The basic aims would be to increase skills levels, introduce modern manufacturing systems and techniques, and open up greater market access.

the dti has now received a high-level business case for the establishment of such a facility, and it is expected that funding for its establishment will be secured during 2017/18 for implementation in 2018/19.

This initiative has been prioritised in IPAP 2018 and is being co-driven by **the dti** and the South African Furniture Initiative. The CSIR has been identified in as a leading support institution.

Single-dose Malaria treatment

The Material Science and Manufacturing (MSM) unit of the CSIR secured a US \$1 million contract with the World Health Organisation to produce a single-dose malaria pill, based on MSM's encapsulation technology.

R&D-led industry development initiatives

DST-funded R&D investments over the past 10 years have started to yield industrial impact. The time required for maturing the knowledge/research and technology to a viable industrial product/service varies according to the nature of the innovation. As an example, investments in disruptive technologies such as Aeroswift (3-D printing) or the direct manufacturing of titanium powder require approximately ten years to reach maturity (also depending on the level of funding/effort).

Currently the following projects/initiatives are close to being introduced into the market:

- Ti-metal powder production: technology maturation is progressing slowly due to the inherent complexity of scaling up the volume of production per hour. The next step will be the execution of a techno-economic review; to be followed by the first commercialisation step, the establishment of a special purpose delivery vehicle to further upscale the technology for an industrial and commercial environment.
- Aeroswift: technology development up to prototype stage has been completed, with the effort now on verification and validation of the printed components. In addition, the first commercial versions are being designed and manufacturing of two commercial Aeroswift versions is expected to commence in FY 2018/19.



3.4. HIGHLIGHTS: DEMAND-SIDE RDI INTERVENTIONS

The Technology Localisation Implementation Unit (TLIU)



The DST set up the Technology Localisation Implementation Unit (TLIU) in 2012. Its initial mandate was to help achieve the outcomes of the Competitive Supplier Development Plan (CSDP) linked to the Infrastructure Rebuild Programmes of Eskom and Transnet.

However, over the lifecycle of the TLIU the Unit has been re-aligned to support other imperatives linked to the National Development Plan (NDP).

Since 2012 the TLIU has provided supplier development and localisation support to over 200 locally-owned manufacturing companies. The companies supported are

directly and indirectly involved in the localisation programmes of state projects. Over 65% of these companies are Qualifying Small Enterprises (QSE) or Emerging Micro-Enterprises (EME). The companies supported by the TLIU are based in Gauteng, KwaZulu-Natal, Western Cape, Eastern Cape, Mpumalanga and Northern Cape.

Through the support provided by the TLIU there are now many instances where previously imported products are being produced locally. The list below indicates the impacts that has been achieved in replacing foreign manufactured components with locally manufactured components.

Exhibit 1: outputs and impact from providing technological assistance to 154 firms

- 700 jobs created.
- 7,910 jobs retained at companies that received technology support.
- 103 new projects secured by such companies, to a value of R488 million.
- R122 million generated from company tax (due to increased turnover).
- 252% return on DST investment (based on tax payable).
- Enhancements in skills, capabilities and technology is contributing towards increasing firm competitiveness.

Mining Occupational Health and Safety

The CSIR helps to ensure the health and safety of South African mine workers by offering specialised analytical, testing and training services and by doing research and development in the field of mining occupational health and safety.

Highlights from the MOHS

- More than 5,000 pieces of safety and emergency equipment are tested annually to ensure equipment is safe for use and to enable mines to comply with the related legislative requirements. Equipment tested includes lifting and hoisting gear, emergency breathing equipment and steel wire ropes.
- Safety awareness training in the field of mine fires, methane ignitions and coal dust explosions was provided to more than 3,500 mine workers each year.

- The CSIR has developed and patented several products that improve the safety and performance of self-contained self-rescuers (emergency breathing equipment). The most recent development is an innovative training device that provides the user with a realistic experience of the use of a self-contained self-rescuer.
- The CSIR operates national testing and research facilities that offer unique capabilities in the fields of mechanical testing and in the evaluation of products intended to prevent, suppress and mitigate explosions in coal mines. Manufacturers of mining equipment and products rely on the CSIR to provide mandatory product verification testing as part of their development and quality control processes.
- Through directed research in the field of air quality the CSIR has contributed to the improvement of the health of mine workers and the communities close to mines and mineral processing plants.

Industry Innovation Partnership Fund (IIPF)

A number of instruments have been devised to raise industry R&D levels and help improve competitiveness in specific industry sectors/sub-sectors through technology development or pre-competitive R&D. The Sector Innovation Fund (SIF) jointly funds R&D and postgraduate human capital development in sector-related technologies, addressing problems identified by the respective sectors.

Currently there are active SIF programmes in the domains of wine technology, sugar (post-harvest), fish breeding and mining and minerals.

4. Special Economic Zones and Industrial Parks

4.1. Special Economic Zones (SEZs)

The SEZ programme is one of the critical tools government has prioritised for accelerating South Africa's industrialisation. It is specifically designed to attract foreign direct investment (FDI), improve existing infrastructure, develop new industrial hubs and create significant numbers of new, decent jobs.

The Special Economic Zones Act (No 16 of 2014) has now entered its implementation

phase and the key legislative frameworks have been established. These include (beyond the founding Act) the promulgation of SEZ Regulations, a Monitoring and Evaluation Framework, SEZ Fund Guidelines and SEZ Incentive Guidelines. **the dti** has also recently finalised the process of public consultation on draft SEZ Governance Regulations.

The total number of designated Special Economic Zones has to date increased to eight. These are: Saldanha Bay (WC), Dube Trade Port (KZN), OR Tambo (GP) Coega (EC), East London (EC), Richards Bay (KZN), Musina (Limpopo), and Maluti a Phofung (FS).

The number of operational investors in designated SEZs has increased from 72 to 85, with a total investment value of over R9 billion. The number of direct jobs created currently stands 13,561; but this is expected to increase substantially as the new investments come on-stream.

Considerable investments are already flowing into a number of the SEZs:

- At Coega, various projects with a combined value of some R12 billion are under construction. These include investments by BAIC automotive, Osho Cement, MM Engineering, and the construction of a Customs Control Area Warehouse (CCA) in Zone 1.



Dube TradePort SEZ has secured R1.2 billion of operational investments and attracted a further R1.8 billion of committed investments. The DTP SEZ's total assets increased to R4,3 billion, generating revenue of R111 million.

- In Richards Bay SEZ, a R300 million PVC pipe manufacturing plant has been established and is in operation.
- In Maluti-a-Phofung SEZ, investments valued at a combined R350 million in the beef processing and chemical sectors have been secured. The construction of the two factories commenced in February 2018.
- **the dti** has recently completed a process of public consultation for the proposed Atlantis Green-Tech SEZ in the Western Cape province, and the process of designating the zone is almost complete. Five companies are already operational in Atlantis, with a total investment value of around R680 million.
- The SEZ Operator Permit to authorise the development and management of the Musina-Makhado SEZ (Metallurgical Zone) has been issued to South African Energy Metallurgical Base, a subsidiary of a Chinese conglomerate, Shenzhen Hoi Mor Resources Holding Company. The total investment is currently estimated at around R56.9 billion.

To derive maximum benefit from the development and implementation of SEZ policies, a five-year agreement was signed in 2014 between **the dti** and the Ministry of Commerce (MOFCOM) of the Peoples' Republic of China. Through this MoU 108 officials have already been trained.

4.2. Industrial Parks

In September 2015, **the dti** launched a structured programme for the revitalisation of industrial parks in a number of old industrial areas across the country. The main objective is to accelerate economic development in the lagging regions by attracting investment, supporting job creation in the manufacturing sector and assisting regions to build, strengthen and develop strategic industrial capabilities.

This programme is currently focused on 11 industrial parks countrywide and is implemented through national government partnerships with the provinces, their

agencies and municipalities. A budget of R415 million has been allocated, of which R231 million has already been spent. To date 55,000 people have found employment through the programme.

5. Foreign Direct Investment (FDI) Effort

Over the review period foreign direct investment (FDI) has played a significant, if volatile, role in the development of the economy. South Africa was Africa's best foreign direct investment (FDI) performer in 2013, as well as leading the trend towards increasing intra-African investment, according to UNCTAD's 2014 World Investment Report.

The UNCTAD report showed that FDI inflows to South Africa jumped from US\$4.5-billion in 2012 to a record-high \$8.1-billion in 2013, mainly driven by investments in infrastructure. However, FDI tapered off sharply in 2014/15, before increasing by 38% in 2016 to a (still rather modest) US\$ 2.4 billion (UNCTAD, 2017).

The sectors attracting the most FDI are energy, telecommunication and services. The 2016 Foreign Direct Investment Projects Database from Trade and Industrial Policy Strategies (TIPS) identified a total of 30 large-scale investments, either ongoing or announced, with a combined investment value of R123 billion and the potential to create around 22,000 permanent jobs.

Notable recent developments have included:

- BMW's construction of a state-of-the-art regional parts distribution centre in Midrand. The project includes a training centre and offices for its IT operations hub. The investment value of the distribution centre is R200 million.
- Amplats' launch of a new R474 million chrome recovery plant which will produce commercial grade chromite concentrate.

6. National Export Effort

the dti has played a critical role in the promotion of economic development and in increasing exports in selected target markets. In partnership with the Provincial Investment Promotion Agencies (PIPAs), it undertakes export promotion activities, specifically in markets that are aligned to South Africa's international relations and co-operation agreements.

The Department has introduced the National Exporter Development Programme (NEDP) with a particular view to increasing exports of products and services that add value, contribute to employment and develop the green economy.

In 2016, the Integrated National Export Strategy (INES) was launched to help advance the global competitiveness of South African exporters and try to tap into export-led economic growth benefits.

Since the establishment of the Export Marketing and Investment Assistance (EMIA) fund, 5,288 companies have been supported to a value of R738.56 million. These companies have generated export sales to a total value of R22.5 billion. This implies that for every Rand the Department spent, the companies generated R30.53 worth of sales.



KEY CONSTRAINTS ON INDUSTRIAL POLICY

MAJOR CHALLENGES

Notwithstanding positive outcomes in key sectors - and the crucial role that IPAP interventions have played in preventing further and potentially catastrophic de-industrialisation - South Africa still faces many serious challenges on its road to re-industrialisation.

The implementation of IPAP has continued under the shadow of uneven and hesitant global economic recovery and against a set of deep-seated domestic structural problems and constraints which, taken together, persistently undermine the competitiveness of the manufacturing sector.

These include the following major issues:

Lack of policy coherence and programme alignment

Experience has by now amply demonstrated that industrial policy has *not* been able to gain the traction required in circumstances where there is lack of policy certainty, programme alignment and integrated support across government. This has a severe negative impact on a) the effective use of critical industrial policy levers like localisation; b) positioning the country to take full advantage of new growth opportunities related to the Digital Industrial Revolution; and c) leveraging South Africa's comparative resource advantages by linking the primary sectors of mining and agriculture with the manufacturing sector, across all the key value chains.

The big issues that have come to light have been persistent non-compliance with government policy on localisation and the sub-optimal role of SOCs as economic enablers and industrial drivers. The lack of proper alignment of key SOCs with government industrial policy has not just been a matter of poor coordination; it has often been both caused and compounded by corruption, collusion and rent-seeking.

Taken together, these dysfunctions have resulted in enormous leakages from the domestic economy, have supported unnecessary imports and have generated a myriad of negative market signals, undermining confidence, investment and sovereign credit rating.

1 Renewable Energy Independent Power Producers Programme.

2 Mineral and Petroleum Resources Development Act.

3 Grateful acknowledgement for the content of this section is made to Teboho Bosiu, Sumayya Goga, and Simon Roberts, *Policy Briefing Paper 1*, Industrial Development Think Tank, UJ, Dec. 2017.

A few examples of the negativities which have arisen as a result would be the stalling of the highly successful REIPPPP¹ renewable energy programme; ongoing uncertainties around proposed amendments to the MPRDA² and the Mining Charter; and the failure so far to establish a viable framework for gas-based industrialisation.

Further linked to the under-performance of key SOCs has been the pressure placed on manufacturing by sharply escalating and 'bunched up' administered prices – most notably, electricity and port charges - and rail and port inefficiencies and logistical bottlenecks.

Successive IPAP iterations have pointed to the urgent need for Government to step up efforts across departments to develop a methodology for establishing more rational and consistent administered prices, both for consumers and especially for industrial users

Concentration of ownership and control³

The extreme concentration of ownership and control in the South African economy - with a small number of large firms dominating most sectors - remains one of the country's greatest economic challenges. Debates about whether these companies are 'hoarding cash' or business is on an 'investment strike' miss the point. The bottom line is that companies have market power and are using it to earn good profit margins, but investment remains weak. The opening-up of the economy to a diversity of participants has not happened and, if anything, concentration and vertical integration within sectors has increased since 1994, reinforced by high barriers to entry.

The claims by some that concentration reflects the efficiency of large firms is difficult to square with poor productivity performance and low investment in the economy as a whole. The prevalence of cartels in South Africa suggests that concentration and low levels of competition have gone together.

Large firms have also lobbied and strategised to undermine rivals, as would be expected. The reality that smaller participants are locked-out of markets further feeds the perception that the only way to gain access is by using state leverage to appropriate rents.

At the heart of the discussion on whether firms are investing in the South African economy is the relationship between competition and productivity. While large firms may claim to be better placed to innovate and upgrade capabilities, monopolists have incentives to focus on maintaining their position by lobbying and raising barriers to entry to continue to earn returns from exertion of their market power.

High entry barriers and arrangements which weaken small and medium firms therefore undermine economy-wide investment. As financial market imperfections mean that retained earnings are important for firms' ability to make investments, smaller firms are typically more constrained in terms of the liquidity they can use to invest.

Competitive markets and policies which lower barriers to entry are therefore important instruments to stimulate innovation and open up opportunities to entrants with new business models and products. Competitive markets further incentivise firms to reduce costs and raise productivity within sectors, investing in expanded productive capabilities.

The patterns of ownership, concentration, competition and orientation of large firms are thus critical to understanding the low levels of fixed investment and the failure to move towards more inclusive growth. Evidence from international studies shows that achieving growth and development requires structural transformation, moving within and across sectors to higher-value activities.

The proposed amendments to the Competition Act are an important step in the right direction. They are intended as part of a package of measures including actions to address barriers to entry, access to development finance, improved regulation and targeted industrial policies to support rivalry and open up markets. Government is conscious of the need to ensure that new measures keep the door open to the deployment of other industrial policy measures and that they support 'safe harbours' for supplier development and clusters.

High private sector input costs

Linked to the discussion above, the high price of key intermediate inputs – steel, chemicals and products in the plastics value-chain - remains a continuing constraint on the competitiveness of SA manufacturing.

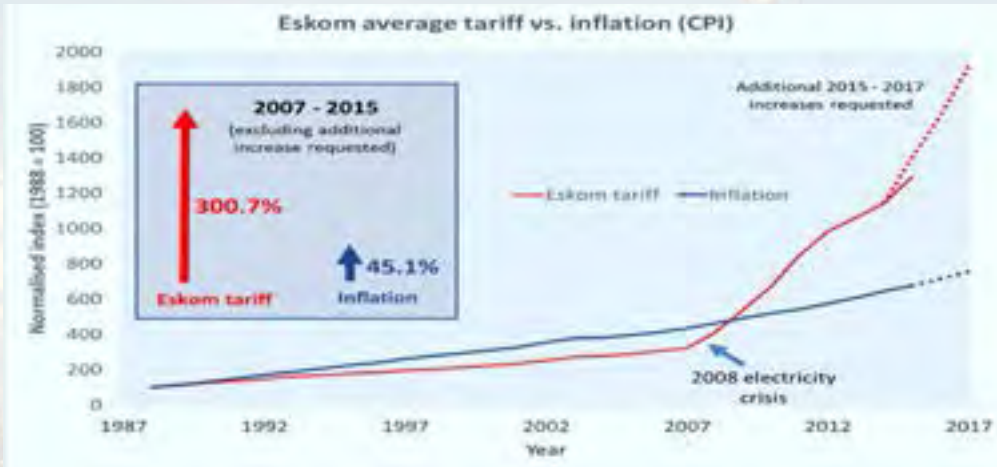
Electricity



The security and predictability of electricity supply – undermined as it has been by interruptions and Eskom price hikes - represents a major and increasingly acute concern, as are the triple-digit premiums added onto Eskom prices by municipalities implementing a local government funding model based on both cost recovery and revenue generation from electricity. This is often compounded by significant inefficiencies and inconsistencies within and between municipalities and billing problems. Industrial competitiveness deteriorates relative to counterparts in other jurisdictions, with loss of volume resulting in reduced shifts and ultimately plant closures and job losses.

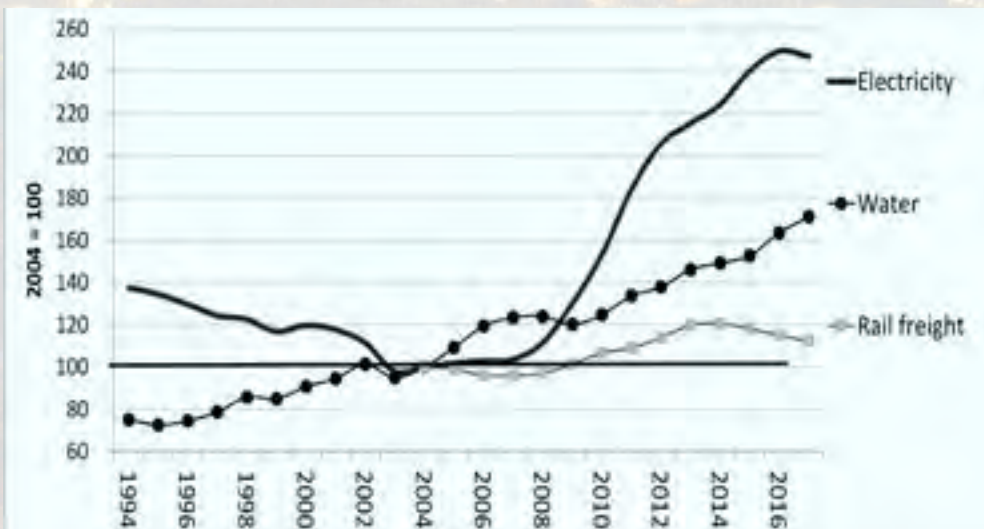
Continuing escalation of electricity costs, especially for medium and small companies in vulnerable sectors such as foundries, means that municipal customers have and are increasingly becoming less competitive than Eskom-fed competitors. This situation gives rise to negative unintended consequences, including acting as an incentive for irrational short-term behaviour such as moving to an Eskom-supplied zone.

Figure 1. Eskom average vs inflation (CPI)



Source: Map to a million initiative by Manufacturing circle

Figure 2. Increase above CPI of tariffs for electricity, water, Transnet Freight Rail



Source: Electricity and water calculated from Statistics South Africa.⁴

4 Producer Price Index. Series from 1990 to 2017. Excel spreadsheet. Series for electricity and water chained for different time periods and deflated with average CPI for year. Transnet freight rail calculated as average revenue per tonne from information on rail revenue and freight carried in tonnes from Annual Reports for relevant year, deflated with average CPI for year.

Water supply and availability

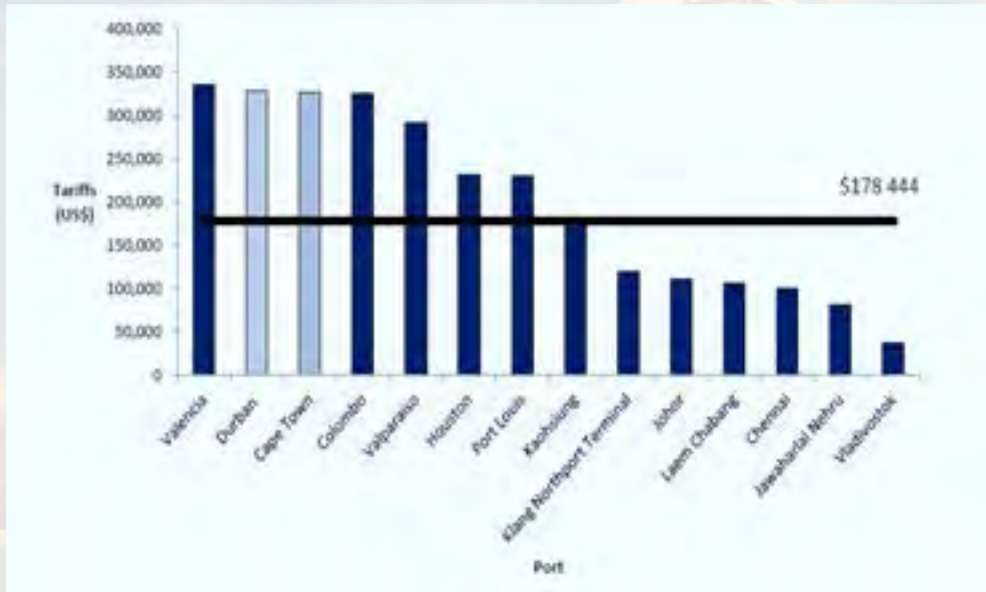
An increasingly serious problem that needs to be addressed is recurrent interruption of water supply, especially in smaller municipalities and to small and medium companies.

Port tariffs



High port charges and inefficiencies are a significant barrier and constraint on the export of value-added goods. The cost of export of value-added tradable goods has for some time now been higher than both the cost of exports of primary commodities and the import of tradable goods. Graphs 3 and 4 illustrate that South African port costs are well above the global average.

Figure 3. Total port costs including terminal handling charges for containers per ship in 2016/17



Source: Ports Regulator

However, it must be noted that improvements have recently been realised thanks to the work of the National Ports Regulator.

Transport and logistics constraints

High logistics costs and economic infrastructure blockages limit the country's economic development, thus impeding industrial development and competitiveness. The performance of the logistics system has a major impact on the economy - especially in the primary and secondary sectors, which are heavily reliant on a sound transport infrastructure. (The manufacturing sector is a secondary sector in the sense that it involves the movement of manufactured goods).

High logistics costs therefore affect manufacturing cost structures and revenues, as well as value-addition in manufactured goods and services. Producers are also negatively affected with respect to delivery times, product quality and customer responsiveness capabilities.

Customs



Illegal imports, customs misdeclarations, improper practices such as staged consignments and the importation of sub-standard products constitute a severe ongoing threat to local manufacturing.

Far greater intra-government effort is needed to curtail these practices; and this effort should be urgently backed up by a programme to upgrade the capacity and capabilities of the Customs Division of SARS.

Skills for the economy

We have to confront the fact that the current structure of the SA economy is ill-suited to the creation of large numbers of jobs at appropriate skill levels.

By this we mean that:

- the composition of the economy by sector (primary, secondary, and tertiary) is not appropriate for South Africa, given widespread and well-known developmental challenges;

- within manufacturing, the labour-intensive sectors are not growing fast enough to create large numbers of jobs;
- jobs in the tertiary sectors are not substitutes for jobs in the productive sectors; rather, the development of higher value-added productive sectors creates multipliers that support better quality jobs in the tertiary sectors;
- Apartheid spatial geography continues to constrain the economy in terms of worker travel time and costs.

The challenge of skills deficits and mismatches - especially in critical sectors of the productive economy - has continued to hinder industrial and technological development, as the economy is not producing the skills required by the manufacturing sector. There is thus an urgent need for further demand-led skills interventions in these sectors – particularly in the light of the fast-developing Digital Industrial Revolution.

Concerted effort to address these issues must include support for better demand-side planning, deeper involvement of the public and private sectors in providing resources for training, and a more strategic and sustainable approach to meeting scarce skills needs in identified high priority areas of the economy.



TRANSVERSAL FOCUS AREAS



1. Public procurement and local content

1.1. DESIGNATION

Situational analysis

In 2017, Public Procurement amounted to R842 billion – this according to National Treasury audited consolidated financial statements, after eliminating differences in accounting standards and inter-entity transactions. (National Treasury, 2017), Table 1.

This indicates that public expenditure has a huge impact on the economy in terms of its potential for economic growth and job creation. It is also evident that government can use its financial muscle strategically to achieve other objectives such as increasing domestic production and further enhancing competitiveness in domestic industry.

As a response to the many socio-economic challenges the country faces, the South African government has prioritised the procurement of locally manufactured products/commodities to support industrial development. Implementation of this priority takes place through the current procurement legislation - the Preferential Procurement Policy Framework Act (PPPFA) and its regulations.

In 2011, the Preferential Procurement Regulations were amended to make provision for the promotion of locally produced products/goods and to empower **the dti** to designate products, sectors and sub-sectors with minimum local content thresholds for local procurement by all organs of state.

The Regulations were reviewed once more in 2017, and the new Regulations – aimed at strengthening compliance with local content thresholds by state entities – and came into effect on 1 April 2017.

Figure 1. Government expenditure on goods, services and related items.



Source: National Treasury Database, 2017

In the Medium Term Strategic Framework (MTSF) 2014-2019, government identified local procurement as key policy lever to support re-industrialisation objectives through promotion of local production and increasing the productive sectors' share

of production and employment. The MTSF has a local procurement target of 75% (to be achieved by 2019) of all products capable of being manufactured locally on a commercially viable basis.

1.1.1. The Preferential Procurement Regulation 2017 on Local Content and Production

Local Production and Content is under section 8 of the Regulations:

- Regulation 8(1): empowers **the dti**, in consultation with National Treasury, to designate specific industries/sectors, where only locally manufactured products that meet the stipulated minimum threshold for local content will be considered.
- Regulation 8(2): organs of state are obliged to include local content in invitations to bid for products that are designated.
- Regulation 8(3): National Treasury will timeously inform organs of state of new designations through circulars.
- Regulation 8(4): allows organs of state to “self-designate” provided they consult with **the dti** and National Treasury
- Regulation 8(5): Any bid that fails to meet the required local content threshold is unacceptable and should be disqualified.

1.1.2. Sectors/products designated for local production in the Public Procurement System

A total of 23 sectors/products have so far been designated for local production with minimum local content thresholds. (See Table 1, p.42 above for recently designated products).

1.1.3. PROGRESS ON DESIGNATED SECTORS/PRODUCTS

SATS 1286: 2011 Review

The mandatory requirement in designation is that all suppliers must meet the set minimum thresholds for local content when they are tendering for goods, works and service contracts within the public sector. A provision is also made

in the process for some form of relaxation in a case where bidders cannot meet the required minimum thresholds due to non-availability of materials, designs, standards, and technological choices. Bidders can approach **the dti** at the time of bidding, whilst the tender is still open, to obtain a letter of authorisation/exemption to support their local content declarations and cover them for the shortfall. The technical specification (SATS 1286:2011) has up to now been used by both bidders and procuring entities before implementation of local content.

The specification provides the standard definition of local content, which is expressed as a percentage of the tender price and primarily based on local manufacturing. Bidders are therefore compelled to use the standard formula in calculating their local content.

A task team comprising officials from various departments was established to review the technical specification, with the primary aims of closing identified gaps and dealing with ambiguities. This work has since been finalised and the document is now published by the South African Bureau of Standards (SABS) as a National Standard (SANS 1286: 2017).

1.1.4. Tenders reported to the dti

Table 1 shows that as from March 2015 to July 2017, almost R59.95 billion has been locked into the country through local content requirements. The major transaction was on the rail rolling stock fleet procurement, amounting to about R49.5 billion. However, only 4.4% of the monetary value of tenders designated for local production was verified.

**Table 2. Value of tenders designated for local production:
March 2015-July 2017**

Designated products	Signed standard bidding documents submitted to the dti	Total value per sector R '000	No. of companies verified	Tender value verified	% Verified: (Total value/tender value verified)
Textiles & clothing products	312	1,968,084	2	624,417	31.73%
Furniture products	75	228,092			0.00%
Electrical & telecom cables	26	1,754,244	3	257,810	14.70%
Canned & processed veg	5	2,008			0.00%
Valves & actuators	18	74,934			0.00%
Rail rolling stock	4	49,547,220			0.00%
Set-top boxes *	1	4,300,000	3	600,000	13.95%
Power pylons	3	740,212	3	740,212	100.00%
Solar water heaters **	13	446,253	12	303,055	67.91%
Steel products	2	207			0.00%
Buses	3	806,600	1	132,481	16.42%
Working boats & vessels	3	86,020			0.00%
TOTALS	465	59,953,874	24	2,657,975	4.43%

* One tender but different suppliers appointed as a panel by USAASA

** Tender value not known at time of verification due to a panel appointment of potential suppliers by the DoE

Source: dti and SABS Local Content Databases 2017

1.1.5. Continuous use of Regulation 8.4 to support localisation of non-designated products

Regulation 8.4 of the 2017 Preferential Procurement Regulations facilitates local procurement of non-designated and/or yet-to-be designated products/commodities. It provides that if there is no designated sector, an organ of state may include, as a specific condition of the tender, that only locally produced services or goods or locally manufactured goods with a stipulated minimum threshold for local production and content, will be considered.

The threshold must be in accordance with the standard determined by **the dti** in consultation with National Treasury. **the dti** and National Treasury have recently agreed on the Standard for Implementation of Regulation 8.4 to be processed for circulation.

In summary, the standard covers the following key points: promotion of local production and content through designating specific tenders to promote

locally manufactured products; invitation of bids for non-designated products; authorisation to lower thresholds where bidders fail to reach approved minimum thresholds; and quantity demands for the tender.

This is an important instrument in achieving the local procurement target of 75%. A clause dealing with local procurement of non-designated and/or yet-to-be designated products/commodities must be retained in the forthcoming Public Procurement Bill.

the dti insists on the retention of this lever to ensure that it is widely implemented across the state, with the necessary capacity-building to support its implementation.

1.1.6. CHALLENGES TO IMPLEMENTATION OF LOCALISATION PRESCRIPTS

1.1.6.1. Compliance with local content requirements

The following compliance areas have been identified as being problematic:

- Advertisement of tenders with local content requirements.
- Submission of correct declaration documents by bidders (the Standard/ Municipal Bidding Documents 6.2 and accompanying annexures).
- Declaration of correct minimum thresholds for local production by bidders.
- Proper evaluation of bids in terms of local content requirements (no points are to be allocated for local content, but it is the first hurdle that must be achieved by bidders).
- Understanding of local content requirements and industrial policy objectives by both Bid Evaluation and Adjudication Committees.



- f. Post-tender award reporting to **the dti** by the organs of state (submission of signed Bidding Documents and relevant Annexures).

The Auditor-General's office has been engaged on this matter and the auditing of expenditure on the procurement of designated products is now taking place. Several institutions are now calling on **the dti** to assist them with implementation to avoid incurring irregular expenditure from failure to adhere to local content prescripts.

However, there are no stringent legal and administrative measures to deal with non-compliance. Government is currently too uncoordinated, fragmented and institutionally weak to carry out the function of adequately monitoring compliance on localisation. This suggests the need for tighter coordination between **the dti** and NT to ensure that these matters are vigorously followed through, with appropriate consultation and capacity- building and with an eye towards identifying gaps in the existing legislative and regulatory framework that need to be filled.

At the same time, enforcement remains a major issue: In terms of the current PPPFA regulations, **the dti** has powers to designate sectors but no powers to punish non-compliance.

1.1.6.2. Funding options for the cost of local content verification

Local content requirements are such that all suppliers must meet the minimum thresholds when they bid for tenders designated for local production. These thresholds and local production have to be verified by the SABS after tenders have been awarded to the successful bidder(s).

the dti is currently exploring funding options to cover the cost of verification such as creating a budget line/cost allocation to cater for verification, within the SABS budget. High value /volume contracts will be prioritised for verification.

Key Action Programmes

1. Participation in public procurement reforms

Nature and Purpose of the Intervention

the dti is a participant in public procurement reforms led by National Treasury. Submissions were made that led to the 2017 Preferential Procurement Regulations and on the Public Procurement Bill.

The current plethora of Acts, regulations and institutions makes it difficult to measure the attainment of government's socio-economic objectives through public procurement, because policy practices and divergences result in uncoordinated outcomes. The public procurement reforms will, therefore, assist in consolidating different statutes, regulatory frameworks and the actions of organs of state dealing with public procurement.

Targeted outcomes

Minimal incidence of corruption, industrial development.

Key milestones

2018/19 Q1-Q4: Technical inputs to the Procurement Lab to be led by DPME.

2018/19 Q1-Q4: Technical inputs to the public procurement reforms (the Public Procurement Bill).

Lead departments/agencies: dti, NT, DPME

Supporting departments/agencies: DPE, EDD, National and Provincial Departments

1.1. Designation of further sectors for local procurement

Nature and Purpose of the Intervention

Further 'waves' of designation will follow, in keeping with the priorities set out in the IPAP:

- Continue working with the Presidential Infrastructure Coordinating Commission and Industry Associations to identify localisation opportunities in big-ticket items defined in government's strategic infrastructure projects at all levels of government.

- Continue to scan for opportunities for further designations in the metal fabrication, capital equipment and transport equipment sector.

Targeted outcomes

Resuscitate local manufacturing sector and job creation in associated supply chains.

Key milestones

2018/19 Q1-Q4: Work with the Presidential Infrastructure Coordinating Commission and Industry Associations to identify opportunities for further designation. Designation of additional products.

2018/19 Q1-Q4: Deepen localisation by utilising Regulation 8.4 of the PPPFA for the procurement of non-designated products/commodities. This will be done in consultation with other government departments and state-owned companies; and will go a long way towards effective realisation of the local procurement target of 75% set by government in the MTSF.

Lead departments/agencies: **the dti**, EDD

Supporting departments/agencies: NT, Proudly SA, DPE, EDD, SABS

1.2. Improve compliance levels on local content

Nature and purpose of the intervention

Government will continue to work to closely monitor non-compliance and follow-up on published tenders to provide needed support to organs of state for smooth implementation of the local content requirements.

Where applicable, gaps will be identified in the public procurement system and intervention plans will be developed to address them. Moreover, focus will be on the tendering process: design/preparation stage, Bid Specifications sessions, Bid Evaluation Committee (BEC) and Bid Adjudication Committee - to provide strategic guidance regarding putting together a compliant bid, local content evaluation and reporting post- award.

Targeted outcomes

Increased levels of compliance; capacitated SCM officials and industry players.

Key milestones

2018/19 Q1-Q4: Capacity building provided to supply chain practitioners in all spheres of government including state owned companies, as well as industry players.

2018/19 Q1-Q4: Develop a robust system of monitoring and enforcement of designations.

Lead departments/agencies: **the dti**, AG, DPME

Supporting departments/agencies: NT, Proudly SA, DPE, EDD, SABS

1.3. National Industrial Participation Programme (NIPP)

Situational Analysis

The National Industrial Participation Programme is currently managing NIP obligations estimated at R 10 billion. These obligations arise out of purchases mainly from sectors such as Defence, Oil and Gas, Automotive, Aerospace, Rail, Energy, and ICT. The number of companies with NIP obligations is spread across Defence (7); Oil and Gas (12); Automotive (6); Aerospace (7); Marine (3); Rail (3) and ICT (5).

The business unit is also negotiating NIP contracts with pharmaceutical companies. These NIP obligation agreements are estimated at R10 billion and are expected to be finalised before the end of financial year 2018/19.

Key Opportunities

1.1.1. Local design and manufacture of fire-fighting truck components

Marce' Fire Fighting Technology is a company that specialises in the design, manufacture and supply of fire-fighting vehicles to the Sub-Saharan African market. In partnership with the Moipone group of

companies, Marce' Fire-Fighting Technology was awarded a contract by Armscor to supply aviation rescue and fire-fighting vehicles for the South African Air Force. As a result of this contract, Moipone-Marce' JV incurred a NIP obligation agreement with **the dti**.

As part of this agreement, Moipone-Marce JV submitted a business plan committing the JV to invest approximately R 10 million to set-up a production facility in Centurion, to produce four components of the fire-fighting truck; and, in the process, increase local value-addition from a designated threshold of 30% to an average of 65%. The business plan was approved by the IPCC in August 2017.

Table 3. Financials and Job projections for Moipone-Marce NIP project

	Local Content	Investment	Export Sales	Local Sales	New Jobs
Main Cab	65%	2 725 000	30 000 000	5 000 000	4
24" Rim	95%	340 000	7 847 000	3 192 000	0
Chassis Rail	80%	2 215 000	8 695 000	2 220 000	4
Monitors	55%	4 880 000	21 470 000	7 820 000	5
Totals		10 160 000	68 012 000	18 232 000	13

Source: **the dti**

As reflected in the table above, the investment has the potential to generate export revenue to the value of approximately R 70 million and local sales of R 18 million over a period of three years.

1.1.2. Local manufacture and assembly of electronic devices

This business plan addresses the expansion of manufacturing and assembly capacity at the CZ Electronics Manufacturing (Pty) Ltd (CZEM) facility in Boksburg. The capital provided by the obligor Cargotec is to be used for acquisition of equipment necessary to set-up production lines for local manufacture and assembly of open-view decoder boxes and affordable television sets.

The need for additional production lines was prompted by demand from the Pep Group, the Pick'n'Pay Group, and the Switch Group for affordable open-view boxes and television sets. According to the business plan, CZEM has entered into off-take agreements with these retail groups for the supply of approximately 669 million set top boxes to these three retail groups over a period of three years.

In addition to the set-top box deal, the Pep Group has signed a separate off-take agreement with CZ Technologies for the design, manufacture and supply of its own-brand television sets targeting low income earners in Africa. Demand for these television sets is estimated at 457 million units over a period of three years.

In total, this additional business is expected to generate approximately R1.7 billion in sales revenue over a three-year period, with an additional 102 new jobs being created in the process.

1.1.3. Local manufacture and export of Axminster and Wilton woven carpets

The project is about PMP assisting Crossley by putting up a guarantee, as well as paying the cost of interest on the loan for acquisition of machinery needed by Crossley. PMP will also assist Crossley to maintain its competitive edge in the global market.

This NIP support is in response to Crossley having secured contracts to supply Axminster and Wilton Woven carpets for ten Cruise Liners and two Royal Caribbean ships. The company seeks to increase its capacity

by adding four new high-speed machines at a cost of €4.4 million (US\$ 4,655,020). The contribution of PmP is estimated at, USD 423,184.

1.1.4. Pilatus investment into Aircraft Composite Components manufacturing in South Africa

Somerset West-based aircraft and automotive components manufacturer AAT Composites is increasing its reach into the aerospace components industry by producing specialist parts that are lighter and less costly than conventional metal or plastic parts.

Through a joint project with aircraft manufacturer Pilatus, AAT will be included as a Tier-1 supplier into the Pilatus global supply chain and the manufactured parts will be exported worldwide through Pilatus-Switzerland and other Pilatus Group subsidiaries. AAT's increasingly advanced composite design capability will also open up access to Airbus, Boeing and other leading aircraft OEM supply chains.

1.1.5. Rolls Royce partnership with the South African Airways Technical (SAAT)

Rolls-Royce will procure lease engine storage and on-wing services for civil aero-engines from SAAT. This will give SAAT access to Rolls-Royce skills and accreditation to provide these services on behalf of Rolls-Royce's customers in Africa. It will additionally equip SAAT to provide such services to other engine manufacturers, airline and corporate operators.

1.1.6. Airbus work package with Cobham

Another important highlight is the award of a contract by Airbus to South African manufacturer Cobham Satcom as a supplier for the Light Inmarsat Satcom package for the A320 NEO (New Engine Option) and the A330 NEO aircraft. This package consists of enhanced low-gain antennae, multi-channel high power amplifiers and a compact satellite data unit configuration module. Certification of the systems will begin in 2017 and installation on the aircraft platforms is expected in 2019.

1.1.7. Huawei Technology Innovation Laboratory

An agreement has also been reached with Huawei to establish a Joint Innovation Centre (JIC) in South Africa. In collaboration with other Huawei Centres throughout the world, this centre will focus on the development of technologies and software modules for both the domestic and international markets. The envisaged technologies include 4.5 G/5G for the cellular phone industry, smart home solutions (a household management and business communication system), mobile money technologies and application platforms for high end smart phones.

Huawei is estimating that the investment required to establish the JIC is approximately R1.2 billion, and that the JIC will have the capability to generate approximately R5 billion in revenue over a seven-year period, of which 60% of that will be from export markets. The JIC will employ approximately 18 highly skilled jobs over the lifespan of the project.

1.1.8. Local Design and Manufacture of a Biometric Identification Device

In response to its NIP obligation, Hewlett-Packard (HP) invested R30 million in a South African company, Ideco, to design and manufacture a biometric identification device that incorporates a personal computer, camera, scanner and fingerprint reader. The device is specifically designed for voter registration, management of elections and security services, and is aimed at both local and export markets.

Because of its multi-purpose functionality (enrolment, voting, transacting) and robustness, the device is very well suited for operations in remote areas.

The BIMS Device



Key Action Programmes

1. Local design and manufacture of electronic devices

Nature and Purpose of the Intervention

As discussed above, Cargotec, a Finnish company, has committed to invest approximately R15 million into a BEE company, CZ Electronics Manufacturing (PTY) Ltd to enable this company to acquire equipment necessary to set up production lines for local manufacture and assembly of open-view decoder boxes and affordable television sets.

Targeted outcomes

Foreign Direct Investment; Increased sales revenue and export opportunities; job creation.

Key milestones

2018/19 Q1	Expedite plant design and layout, installation of machinery and equipment.
2018/19: Q2 – Q3:	Completion of prototypes and testing exercises.
2018/19: Q4:	Commencement of production phase of the project.

Lead Department/Agency: **the dti**

1.1. Local design and manufacture of fire-fighting truck components

Nature and Purpose of the Intervention

Also as discussed above, the Marce'-Moipone joint venture incurred a NIP obligation upon being awarded a contract by Armscor to supply fire-fighting trucks to the South African Air force. In response to this obligation, Marce committed to invest approximately R 10 million to setup a manufacturing plant in Centurion to produce key components of the fire-fighting truck locally.

These components will include main cabin, chassis rail, rims and fire monitors. The business plan seeks to increase the current local content in the truck to approximately 70%.

Targeted outcomes

Foreign Direct Investment; increased local content; job creation.

Key milestones

- 2018/19 Q1 Expedite plant design and layout, installation of machinery and equipment.
- 2018/19: Q2 – Q3: Completion of prototypes and testing exercises.
- 2018/19: Q4: Commencement of production phase of the project.

Lead Department/Agency: **the dti**

1.2. Local manufacture and export of Axminster and Wilton woven carpets

Nature and Purpose of the Intervention

In response to a NIP obligation, Project Materials Southern Africa (PMP) committed to provide support to a local company; Crossley Carpets, to acquire additional machinery to enable it to increase capacity to meet export demand for Axminster and Wilton woven carpets for 10 Cruise Liners and 2 Royal Caribbean ships. The total contribution by PMP is estimated at US\$ 423,184.

With this NIP support, Crossley is likely to generate additional revenue to the value of about R 400 million within the next 4 years.

Targeted outcomes

Foreign Direct Investment; increased export capacity; job creation

Key milestones

- 2018/19 Q1 Expedite installation of machinery and equipment.
- 2018/19: Q2 – Q3: Commencement of the production phase of the project.
- 2018/19: Q4: Monitor implementation.

Lead Department: **the dti**



Crossley Axminster Pattern 61-AC3069-Q9-A1



2. Industrial Financing

Situational analysis

South Africa's Industrial Policy Action Plan (IPAP) recognises the need for the country's industrial financing incentive packages to be competitive in respect of their accessibility, costs, terms and conditions, in order to attract investment in a competitive global context.

Incentives are part of SA's industrial policy tool kit to create the best conditions for South African businesses to manufacture products, innovate, and create job here in South Africa. South African manufacturers are facing international competitors who benefit from carefully-orchestrated national manufacturing strategies which typically include: (i) financial support (in the form of grants and tax incentives) for the procurement of productive assets; (ii) research and skills development initiatives; and (iii) support for infrastructure development.

While South Africa has recognised the importance of such interventions for some time, what is now needed is a much a much sharper, better coordinated and sustained national focus, to ensure that policies are appropriately targeted and flexible enough to help manufacturers compete globally and to strongly incentivise the reindustrialise the economy. The key issue here is to design and impose meaningful conditionalities wherever incentive support is given.

Ongoing work to strengthen conditionalities is now beginning to bear fruit. A number of manufacturers have put in place measures to include participation of historically disadvantaged individuals in company ownership and management, procurement and skills training. Supplier development requirements have been in place since 2017 to facilitate the entry of new suppliers into established supply chains. Manufacturers including Black industrialist are already being exposed to a range of new markets around the world. Assisted companies are typically retaining (and some also increasing) their core work force. Industrial Parks are being refurbished and upgraded in various townships to provide state-of-the-art facilities to local entrepreneurs at reasonable cost.

Another key driver of competitive incentive programmes is the promotion of public-private partnerships in the manufacturing sector. This requires a better mix of public and private sector funding to support growth and diversification.

The focus for this iteration of IPAP will be on consolidating a competitive incentive programme to support the growth and diversification of the manufacturing sector in the context of a constrained fiscal space.

Key Action Programme

1. Enhancing Incentive Programmes to support the growth and diversification of the manufacturing sector.

Nature and purpose of the intervention

Development of Incentive Programmes that draw on public and private sector sources of funding, to support the growth and diversification of the manufacturing sector through the adoption of production technologies appropriate for the challenges of the Digital Industrial Revolution.

Targeted outcomes

- An approach to industrial financing and other forms of incentives that can be offered by public and private sector role players across the industrial financing value chain.
- Prioritisation of funding support based on the country's developmental objectives, assigning meaningful conditionalities wherever incentive support is given.

Key milestones

- 2018/19 Q1-Q2: Formalise an inter-governmental structure to consolidate and enhance South Africa's investment incentive offering, guided by the outcomes of the ongoing review by DPME of South Africa's business incentives.
- 2018/19 Q2-Q4: Develop a Patriot (National Champion) Corporation Incentive for companies that maintain their headquarters in South Africa voluntarily, produce a significant amount of their goods and services in South Africa, spend 50% or more of their R&D costs in South Africa and source 60% of their inputs from South Africa.

- 2018/19 Q1-Q3: Explore tax support to stimulate demand for products with significant local content in labour absorbing sectors.
- 2018/19 Q3-Q4: Provide support to metal beneficiation for products linked to the Digital Industrial Revolution, including the localisation of some activities in the fields of artificial intelligence, robotics and machine learning wearable electronics and smart living applications.
- 2018/19 Q1: Collaboration with the Department of Agriculture, Forestry and Fisheries to roll out a Black Industrialist-type programme for Black farmers in rural areas across South Africa
- 2018/19 Q1-Q2: Scope further assistance for manufacturers to pursue opportunities in global and domestic supply chains.
- 2018/19 Q1-Q3: Formalise a collaborative forum with private sector financiers to increase funding dedicated to supporting competitive enhancement and transformation in the manufacturing sector.

Lead Department/agencies: **the dti**, NT

Supporting Department/agencies: DAFF, DST, DOL, DHET, DFIs, private sector financiers

3. Developmental trade policy



Technical Infrastructure

Situational analysis

South Africa's technical infrastructure institutions seek to collaborate in the pooling of expertise on a national, regional and international basis to offer solutions to common regulatory (standards) and wider developmental challenges.

The global dimension is critical. The size of the international networks within which the South African entities play their role is evidenced by our membership in, amongst others, ISO, IEC, BIPM, OIML, ILAC and IAF¹ – institutions that cover 96% of the global population.

The Technical infrastructure in South Africa comprises four interlinked entities - the South African National Accreditation System (SANAS), the National Regulator for Compulsory Specifications (NRCS), the South African Bureau of Standards (SABS) and the National Metrology Institute of South Africa (NMISA) - all mandated through legislation.

The South African entities are well-respected by their respective international peers, as is evident from the leadership positions that individuals within the entities are currently occupying – NMISA – President of the BIPM Consultative Committee for Ionising Radiation; SABS – ISO Council member; SANAS – ILAC Treasurer. The entities also occupy various leadership positions at a continental and regional level.

The National Industrial Policy Framework of which IPAP is the implementation plan uses the term “self-discovery”. This implies a dynamic environment that allows for continuous improvement of industrial policy interventions, programmes and processes driven by sector-specific research.

In a rapidly changing business environment it is crucial for economies to stay abreast of the latest developments in technology, trade and the regulatory domain. Participation in technical infrastructure activities - from both a technical and strategic perspective - affords firms, technical experts, industry associations and economic actors in general to keep up to speed with the dynamics of a rapidly changing world.

International trade requires exporting countries to be updated on the latest requirements and to conform to constantly changing new regulations. In order to take advantage of export opportunities, a solid technical infrastructure system is needed; one which is on par with the global best practice and is able to rapidly respond to new international developments ensuring ease of market access.

In the domestic market, meeting technical requirements has become essential for business as it ensures that products and services do not pose a health and safety risk to consumers and the environment, as well as instilling consumer confidence in business. This internationally accepted system serves as a tool for compliant companies to mitigate

¹ **ISO**: International Organisation for Standardisation; **IEC**: International Electro-Technical Commission; **BIPM**: International Weights and Measures Bureau; **OIML**: International Organisation of Legal Metrology; **ILAC**: International Laboratory Accreditation Cooperation; **IAF**: International Accreditation Forum.

the risk of rejection of their products, destined for both the local and the export markets.

The role of a well-functioning Technical Infrastructure system is seen as critical in the international trade arena. This is evidenced by the World Trade Organisation's acknowledgment that such a system could - by basing its norms and standards on those developed by the international standards, metrology, legal metrology and accreditation bodies - facilitate the reduction of unnecessary technical barriers to trade amongst trading partners.

A Technical Barriers to Trade Chapter, spelling out the necessary roles of the Technical Infrastructure Institutions, forms an integral part of any trade agreement. **the dti's** Technical Infrastructure Business Unit - supported by all the relevant TI entities - will continue to participate in the negotiation and implementation of such agreements, both bilaterally and multilaterally.

The implementation of the Tripartite Free Trade Agreement and the Continental Free Trade Agreement will be prioritised.

From an over-arching policy perspective, the technical infrastructure entities are expected to support *re-industrialisation* and *technology-intensive production*. This will require the focused use of resources within the current reality of low economic growth. Inadequate investments in testing infrastructure over the last few years have resulted in a significant loss of capacity and capabilities at the SABS. The organisation is embarking on an extensive drive to recapitalise its facilities over the next 3 years, to ensure that the impact of the SABS on the economy will greatly improve.

The contribution of the Technical Infrastructure to the Digital Industrial Revolution is two-fold: firstly, as enabler - to provide the necessary standards, accurate measurements, testing capabilities and accreditation programmes to respond to industry needs; secondly, as user of new technologies such as 3D printing. To this end NMISA, for example, has designed and built a printer to be used as a measurement system. Various printers were also bought by NMISA to manufacture products for measurement systems.

the dti will continue to strengthen its role as policy owner and provide clear policy direction to the various TI entities, to ensure that they remain and become increasingly responsive to the current and future needs of the SA economy.

Key opportunities

The key opportunities that Technical Infrastructure policies and institutions will exploit over the next three years include:

- Ensuring that the linkages between Technical infrastructure entities are strengthened, to support both the primary and the secondary productive sectors of the economy.
- Proactively addressing key constraints faced by the priority sectors.
- Promoting a close collaborative effort and alignment between government, business and labour.
- Ensuring that technical infrastructure support is available to encourage value-adding growth, labour-intensive manufacturing and advanced beneficiation.
- Taking a leading role in promoting technical infrastructure to better equip emerging industries in the SADC region to be competitive in domestic and international markets.
- Supporting quality infrastructure development in Africa that will facilitate the acceptance of accredited certification, inspection and testing in many African markets, based on single accreditation and a measurement system adapted to intra-Africa trade.
- Actively support SMMEs to improve the translation of innovative ideas into sustainable businesses through targeted technical infrastructure interventions.
- Recapitalising SABS and engineering a turnaround in its offerings to industry.

Key challenges

- Lack of understanding - and therefore underutilisation - of Technical Infrastructure offerings by emerging industries and other stakeholders.
- Since the Technical Infrastructure Institutions serve a variety of regulators, any delay in the implementation of regulations negatively impacts on the effectiveness of TI programmes. Collaborative forums have been established to manage this issue.
- Budgetary issues that constrain the ability of the Technical Infrastructure entities to deliver fully on their mandates. The entities are exploring alternative funding models for those areas of business where they are able to generate income.
- Sub-optimal alignment of Technical Infrastructure Institutions with IPAP sector priorities, including localisation.
- Insufficient domestic testing capacity.

Key Action Programmes

1. Realignment of technical infrastructure activities with IPAP sectors and 9 Point Plan priorities

Nature and purpose of the intervention

This intervention is a continuation of the commitment made in IPAP 2017 to align technical infrastructure activities more fully with the Presidential 9-Point Plan and core IPAP imperatives; most notably, targeted interventions to grow the manufacturing sectors of the economy.

NMISA will continue to strengthen its dimensional measuring capabilities in support of areas such as fibre optics that require constant improvement of national measurement standards to perform tests with higher accuracy. The Length Laboratory will use its recently acquired equipment to provide measurement and testing support to the automotive sector as well as the locomotive building sector by means of component three-dimensional compliance testing as well as on-site large artefact measurement of jigs and fixtures. In addition, there will be a focus on calibrating machine tools to higher accuracies.

Targeted outcomes

Increased domestic industrial capabilities within priority sectors; improved compliance with technical regulations; indirect job creation.

Re-aligned and synchronised technical infrastructure institutions activities, better able to support IPAP and 9-Point Plan priorities.

2. Automotive Products and Components

Nature and purpose of the intervention

NMISA provides traceability to the automotive industry through calibration of the standards required to support a large number of Coordinate Measuring Machines (CMMs) and other dimensional measuring instruments enabling component manufacturing and final assembly. There is a shift in technology whereby measuring is

moving from quality control at the end of the production cycle to continuous inspection on the production line; and there is a parallel shift towards eliminating the human error dimension from quality control through more automation and robotic measurements. NMISA will align its strategy to support these changes in the industry.

Key milestones

2019/20 Q1-Q4:	Upgraded national measurement laboratories for force in support of transport, manufacturing and the automotive sector.
2018/21 Q1-Q4:	Recapitalise SABS testing laboratories in IPAP sectors in order to provide testing services that manufacturers require.
2019/20 Q1-Q4:	Re-established and accredit the calibration articulated arm facility to provide traceability to this growing technology in manufacturing.
2020/21 Q1-Q4:	Re-establish and expand the calibration range of the torque measurement facility to 20 KN-m, in support, particularly, of renewable energy drivetrain technology.

Lead departments/ agencies: NMISA

Supporting Departments/agencies: **the dti**, NT

3. Metal Fabrication, Capital and Transport Equipment

Nature and purpose of the intervention

In support of the automotive industry, NMISA provides advanced materials characterisation services essential to the quality assurance of automotive parts. Industry relies on high-resolution image analysis to aid in product development and quality control. NMISA must benchmark its capability with other international institutes.

Key milestones

2018/19 Q4:	Develop an accreditation programme for the Railway Safety Regulator.
2019/20 Q3:	Roll out the accreditation programme for the Railway Safety Regulator.

2019/20 Q1-Q4: Expand the Material Characterisation facility to include internationally benchmarked and recognised capabilities in support of metal beneficiation and fabrication.

Lead departments/ agencies: NMISA, SANAS
Supporting Departments/agencies: **the dti**, NT

4. Revitalisation of Agriculture and Agro Processing Value Chain

Nature and purpose of the intervention

In response to an industry need for matrix reference materials that are relevant to both South African and African analytical measurement requirements, NMISA is establishing a reference analysis and reference material production facility. The Reference Materials Facility's first project is to provide matrix reference materials for feed and food (mycotoxins in maize, aflatoxins in peanut butter, etc.).

Quality is a prerequisite for exports and standards provide crucial quality assurance on export products. With this in mind, SABS will continue to develop standards and provide the required conformity assessment services and SANAS will continue to provide recognition of conformity assessment bodies' technical competency to support the food industry in producing safe, high-quality products both for local consumption and for export.

Key milestones

2018/19 Q1-Q4: Provide reference materials for pesticides in fruit and vegetable matrices.

2018/19 Q1 - Q4: Expansion of the proficiency testing schemes for aqueous ethanol and aqueous sodium fluoride, in support of alcohol content and blood alcohol analysis, as well as for pesticides in fruit.

2019/20 Q1-Q: Provide reference materials for aflatoxins in peanuts.

2019/20 Q1-Q4: New standard on flexible retort pouches for the food industry.

2020/21 Q1-Q4: Provide reference materials for nutritional content in food in support of new food labelling regulations.

2020/21 Q1-Q4: Provide reference material for antibiotic drug residue in chicken.

Lead departments/ agencies: NMISA, SABS
Supporting Departments/agencies: **the dti**, NT

5. Forestry, timber, paper and pulp, and furniture

Nature and purpose of the intervention

Revised standards will support the forestry and timber industry to improve the quality of wooden poles. These products form part of the critical infrastructure supporting the agriculture, telecommunications and energy sectors.

Key milestones

2018/19 Q4: Revision of standard on wooden poles, droppers, guardrail posts and spacer blocks – softwood species.

2018/19 Q4: Revision of standard on pine poles, cross-arms and spacers for power distribution, telephone systems and street lighting.

Lead departments/ agencies: SABS
Supporting Departments/agencies: **the dti**, NT

6. Plastics, Pharmaceuticals, Chemicals, Cosmetics

Nature and purpose of the intervention

SABS is also responding to an industry need for a supply chain product specification for white petroleum goods (i.e., petrol, diesel, jet fuel, liquefied petroleum gas, ethanol and bioethanol) to improve security of supply and ensure quality of products.

The cosmetics industry will benefit from a revised standard on detergent skin cleaners, which is being expanded to include other types of detergent skin cleaners to keep in line with evolving industry practices. Its application will protect consumers from potentially harmful products available in the market.

Testing capacity will support the health and safety of consumers of traditional African herbal medicines.

Key milestones

- 2018/19 Q3: Establish testing capability for common contaminants and residues in traditional African herbal medicines.
- 2018/19 Q1-Q4: Provide support to the Medical Control Council (MCC) on accreditation provision for medical device manufacturers, distributors and importers.
- 2018/19 Q1-Q4: Build capability to assign purity to peptides in support of biopharma, and protein quantification to support clinical diagnostic measurements.
- 2019/20 Q1-Q4: Revision of standard on detergent skin cleaners.
- 2020/21 Q1-Q4: Expand gas reference material capability to provide traceability for medical gases.
- 2020/21 Q1-Q4: Develop capability to assign purity to Bisphenol-A in support of plastic product safety measurements.

Lead departments/ agencies: NMISA, SABS, SANAS

Supporting Departments/agencies: **the dti**, NT

7. Clothing, textiles, leather and footwear

Nature and purpose of the intervention

In the clothing, textiles, footwear and leather sector, SABS is developing standards on personal protective clothing to ensure safety in hazardous industrial environments like mining and the electrical and petroleum industries.

Key milestones

- 2018/19 Q1-Q4: New standards for personal protective clothing for hazardous industrial environment.

Lead departments/ agencies: SABS

Supporting Departments/agencies: **the dti**, NT

8. Electro-technical and ICT

Nature and purpose of the intervention

SABS is developing standards to support the electrical and electronics manufacturing sector by providing safety requirements for products. With electric cables now designated for local production; compliance with the standard will enable the sector to produce safe, high-quality electric/electronic cables.

The renewal of the testing facilities at NETFA will support the development of the electrotechnical industry. The revitalised facility will also support the fulfilment of regulatory obligations.

The protection of digital resources is critical for all organisations across the different sectors of the economy. The revision of the standards will enable service providers in the ICT sector to provide improved information security management systems to help protect organisations' information assets from unauthorised access by third parties. These standards will also support initiatives being developed in the National Cybersecurity Policy Framework.

Key milestones

- 2018/19 Q1-Q4: NETFA renewal programme.
- 2018/19 Q1-Q4: Revision of standard on electronic cables with extruded solid dielectric insulation for fixed installations (300/500 V to 1900/3300 V) –Service Cables.
- 2018/19 Q1-Q4: Revision of standard on plugs and socket outlets for household and similar purposes – particular requirements for adaptors.
- 2018/19 Q1-Q4: Revision of standards on information technology security techniques.
- 2018/19 Q1-Q4: Establish a national measurement standard for high voltage direct-current.
- 2018/19 Q1-Q4: Feasibility study for specific measurement requirements needed to support the national smart grid initiative.
- 2019/20 Q1-Q4: Develop methods required to measure the photometric properties of Light Emitting Diodes (LEDs).

Lead departments/ agencies: SABS, NMISA

Supporting Departments/agencies: **the dti**, NT

9. Advancing Beneficiation

Nature and purpose of the intervention

Material measurement - and especially accurate characterisation and compositional analysis of the morphology of metals - is a crucial building block for beneficiation and advanced manufacturing. NMISA recently replaced obsolete equipment with state-of-the-art surface and structural analysis capabilities (X-ray Photoelectron Spectroscopy, X-ray Diffraction and an advance 3D electron microscope).

This will allow for accurate surface and bulk measurements of the composition, morphology and structural properties of metals and nano-materials. The standard will contribute towards development of the fuel cell industry which is critical towards overcoming the country's electricity supply constraints. Key industry stakeholders and government are making significant progress under the fuel cell technology programme to accelerate manufacturing locally. SABS published the standard relating to the development of the fuel cell industry in September 2017.

Key milestones

2019/20 Q1-Q4:	Participate in the Versailles Project on Advanced Materials and Standards (VAMAS) to develop materials metrology as needed for beneficiation in the SADC region.
2020/21 Q1-Q4:	Expand materials metrology to support the synthesis and characterisation of advanced materials.

Lead departments/ agencies: NMISA

Supporting Departments/agencies: **the dti**, NT

10. Growing the Oceans Economy

Nature and purpose of the intervention

NMISA's Ultrasound Laboratory has invested in the procurement of instrumentation for the establishment of an ultrasound calibration capability. This will enable equipment that is used to measure distance under water to be accurately calibrated.

Collaborative projects will be initiated with Canada and China for the development of reference materials for aquatic products.

NRCS will issue health guarantees for exported consignments to facilitate access into foreign markets. A health guarantee issued by the competent authority in the country of origin will be required for all imported products. The proposed regulation is developed under Section 36(1) (c) to prescribe administrative or procedural matter for NRCS. The Regulations will be cross-cutting: all Compulsory Specifications will require health guarantees or compliance certificates from competent authorities in exporting countries.

Targeted outcomes

- Improved South African food safety controls on imported fishery and canned meat products
- Standards-based support for the continuing implementation of the Aquaculture Development and Enhancement Programme (ADEP) which aims to boost the ocean economy by providing incentives for marine and freshwater aquaculture operations.

A number of aquaculture standards have been published and others are under development, as highlighted below.

Key milestones

2018/19 Q1-Q4:	Benchmarked capability for ultrasound calibration (mapping of ocean floors, sonar, etc.)
2018/19 Q1-Q4:	Feasibility study for developing a Compulsory Specification for fish oil.
2018/19 Q1-Q4:	Develop a Compulsory Specification for dried abalone.
2018/19 Q2:	Amendment of the Compulsory Specification for frozen rock lobster and frozen lobster products derived therefrom (VC 8020).
2018/19 Q1-Q4:	Finalise the amendment of the Compulsory Specification for canned meat products (VC 8019).
2018/19 Q2:	Finalise the amendment of the Compulsory specification for canned fish, canned marine molluscs and canned crustaceans and products derived therefrom (VC 8014).

- 2018/19 Q1-Q4: Finalise the regulation on administrative regulatory requirements for imported fish and fishery and canned meat products regulated under the NRCS Act.
- 2018/19 Q2: Finalise the new Compulsory Specification for live and raw chilled bivalve molluscs (VC 9107).
- 2019/20 Q1-Q4: New standard for fish oil.
- 2019/20 Q1-Q4: Reference materials for fish toxins.

Lead departments/ agencies: NMISA, NRCS, SABS
Supporting Departments/agencies: **the dti**, NT

11. Resolving the Energy Challenge/ supporting Green Industries

Nature and purpose of the intervention

Alternative energy sources are vital to reducing our reliance on fossil fuel sources. NMISA, in partnership with local universities and overseas partners, is actively developing accurate measurement protocols for advanced materials for use in affordable photovoltaics. The outputs will include the development of reliable materials characterisation methods for nanomaterials, organic photovoltaics and hybrid materials.

NMISA's Gas Flow Laboratory is planning to establish a large gas volumetric calibration facility in support of the gas economy. However, such a facility cannot be accommodated within the current NMISA infrastructure and would require new custom-designed and built facilities. The primary reference gas mixtures required for gas flow traceability will be developed.

Similarly, a wind tunnel is planned for inclusion into the new NMISA facilities which will provide wind speed (anemometer) calibration services in support of wind farms.

Other projects include standards to Improve electrical efficiency, extend the lifespan of lights and ensure consumer safety in the use of lighting products.

The SABS is supporting the green economy by providing a standard on general guidelines for implementation of Environmental Management Systems which will contribute towards environmental sustainability through effective implementation of (EMSs) in industries.

The availability of testing capacity will further support local manufacturers to meet regulations pertaining to the energy efficiency rating of appliances.

Key milestones

- 2018/19 Q1: Testing capability established for appliances included in the Energy Efficiency Labelling regulations (excluding Air Conditioners).
- 2018/19 Q2: Upgrading of geyser test facility to increase capacity through automation - supported by the UNDP.
- 2018/19 Q1-Q4: Revision of the standard on environmental management systems – General Guidelines on Implementation.
- 2019/20 Q1 -Q4: Natural gas composition and calorific accuracy measurements using traceable Primary Reference Gas Mixtures (PRGMs) in support of the gas economy.
- 2020/21 Q1-Q2: Development and validation of PRGMs for stack emission monitoring in support of the green economy.

Lead departments/agencies: NMISA, SABS
Supporting Departments/agencies: **the dti**, NT

12. Updating of the National Building Regulations and Building Standards Act and its Regulations

Nature and purpose of the intervention

The National Building Regulations and Building Standards Act (Act No. 103 of 1977) provides for the promotion of uniformity in the law relating to: a) the erection of buildings in the areas of jurisdiction of Local Authorities; b) prescribing building standards and matters connected therewith.

The basic aim is to ensure safe buildings based on acceptable building science practice, good workmanship and quality materials. The Act predates the Constitution and the updating of this Act is currently subjected to the required Parliamentary processes.

Key milestones

- 2018/19 Q1-Q2: Amendment of relevant National Building Regulations to include plumbing requirements as per the Water Act.
- 2019/20 Q1: Feasibility study on the need for an accreditation programme on the Construction Management System.

Lead departments/ agencies: **the dti**, NRCS, SANAS

Supporting Departments/agencies: the dti, NT

13. Strategic review of legislation

Nature and purpose of the intervention

The current legislation that governs the 4 Technical Infrastructure entities was promulgated between 2006 and 2008. In order to maintain a relevant and responsive South African technical infrastructure, a legislative review was conducted in 2017 to assess the degree to which the current legislation is still effective – and, where appropriate, provide recommendations for amendments.

Key milestones

- 2018/19 Q1 -Q4: The recommendations from the legislative review will be used to develop policy statements, reconfirm the mandates of the entities and draft proposals for Amendment Bills, where necessary; preceded by SEIAS.

Lead departments/ agencies: **the dti**

Supporting departments/ agencies: NT, NMISA, NRCS, SABS, SANAS

14. Consumer protection initiatives

Nature and purpose of the intervention

Safety standards have been published to tighten up the quality and safety requirements of children's toys. These standards will form the basis for the development of a comprehensive Compulsory Specification on toy safety.

Key milestones

- 2018/19 Q1-Q4: Feasibility study on the need for a compulsory specification for Plywood and Composite Board.
- 2018/19 Q1-Q4: The amendment of VC 9085, the compulsory specification for Cement.
- 2018/19 Q1-Q4: The development of a new Compulsory Specification for the safety of toys.

Lead departments/ agencies: NRCS

Supporting Departments/agencies: **the dti**, NT

15. Accreditation programme rollout

Key milestones

- 2018/19 Q4: Develop an accreditation programme for Asset Management System.
- 2019/20 Q3: Roll out the accreditation programme for Asset Management System.

Lead departments/ agencies: SANAS

Supporting Departments/agencies: **the dti**, NT

16. Unlocking the Potential of SMMEs and Cooperatives

Nature and purpose of the intervention

SMME development interventions are primarily designed to support SMMEs in accessing formal commercial markets. SABS and the Jobs Fund Programme are jointly supporting new SMMEs in developing quality products and services that will help them achieve sustainability and profitability. SABS's role in this is to partner with government departments in delivering on their SMME development mandates by developing and delivering appropriate technical support programmes.

NMISA is developing virtual reality-based training modules for SMMEs and regional National Metrology Institutes. These modules will be made available on laptops and smart phones to train SMMEs in the basics of measurement and calibration.

Key milestones

- 2018/19 Q4: SMMEs to be assessed for technical competency in measurement and verification.
- 2018/19 Q4: SABS Design Institute Skills development and job creation programme - supported by the Jobs Fund.
- 2018/19 Q4: SABS SMME-focused technical support by in collaboration with government departments with SMME development programmes
- 2018/19 Q1-Q4: Virtual Reality training modules for high accuracy mass calibration (Level E of OIML), calibration of thermometers and calibration of dimensional standards.
- 2018/19 Q1-Q4: Support SMMEs through training, using a Measurement Practice Improvement Toolkit aimed at assisting SMEs to comply with industry specifications, standards and measurement requirements to improve the quality of the products being manufactured and enhance competitiveness in the market.
- 2019/20 Q1-Q4: Virtual Reality training modules for the calibration of external micrometers and Vernier callipers and the calibration of pressure transducers.

Lead departments/ agencies: NMISA, SANAS, SABS

Supporting Departments/agencies: **the dti**, NT

17. Collaborative research support programme on Science and Technology

Nature and purpose of the intervention

All levels of research, whether basic, applied or developmental, require measurement to gauge progress. NMISA performs research in measurement to establish comparable measurement standards and capabilities for South Africa, and to support scientific research and development in the broader science community. The Materials Characterisation facility of NMISA has some of the most advanced measurement equipment in Africa, actively supporting nano-science and its applications.

A wide range of other measurement capabilities is available for joint research projects with universities and science councils. In 2018 the revised International System of Units (SI) will change the definition of four of the seven base units, rendering the national kilogram (primary standard for mass) a secondary standard and introducing new primary realisations for mass, current, temperature and amount of substance (chemical analysis). NMISA is developing new primary standards for the 4 quantities (kilogram, ampere, kelvin and mole) to shorten the traceability chain for Africa.

Collaborative projects have been established with 6 local universities and are being expanded to universities abroad. Cross-cutting research projects on the SI have been initiated with the National Metrology Institutes of Germany, UK, China, India, Brazil, the USA and Italy. Pan-African research projects are being established with Egypt, Kenya, Ethiopia, Tunisia and Ghana.

Key milestones

- 2018/19 Q1 -Q4: Quantum hall resistance standard and project plan for primary standards for ampere (current) and kelvin (temperature).
- 2018/19 Q1-Q4: Prototype Kibble/Watt balance as new primary mass standard.
- 2019/20 Q1-Q4: Primary standard for Amount of Substance (Avogadro project).

Lead departments/agencies: NMISA

Supporting Departments/agencies: **the dti**, NT

18. Water and Sanitation standards support programme

Nature and purpose of the intervention

Water use in buildings accounts for the largest use of potable water. This standard aims to increase the efficient use of water in buildings, thereby reducing total potable water demand in South Africa. Its introduction will also support building regulations to ensure water efficiency in new constructions.

South Africa contributes to water standards and analysis in the region in a number of ways - for example the Water Proficiency Testing (PT) Scheme, which is being

coordinated through SADC MET. More than 70 laboratories from the testing field, representing 19 African countries, are currently participating. Gravimetrically prepared water samples are analysed and compared against reference values for 15 nutritional and toxic elements and 5 compounds. NMISA's Inorganic Laboratory is the reference laboratory, whose results are used to confirm the elemental gravimetric reference values used in the evaluation of other participants' results.

Key milestones

- 2018/19 Q1-Q4: New standard for water efficiency in buildings.
 2018/19 Q1-Q4: Expand the SADC MET PT schemes to include Organochlorine and organophosphate pesticides in water.

Lead departments/agencies: NMISA, SABS

Supporting Departments/agencies: **the dti**, NT

19. Regional integration

Co-operation on Standards, Quality Assurance, Metrology and Accreditation (Technical Infrastructure)

Nature and Purpose of the intervention

Developing African capacity for technical infrastructure activities can be viewed as a long-term intervention involving the co-ordination and cooperation of technical infrastructure activities such as standards, metrology and accreditation and conformity assessment services within African countries. In this regard, collaboration amongst the continental technical infrastructure institutions - through the Pan African Quality Infrastructure (PAQI) Joint Committee - is of growing relevance.

The capacity to comply with international standards, norms and technical regulations underpins the potential for regional economic and industrial growth and is a precondition for industrialisation efforts - particularly with respect to metrology, standards, accreditation and conformity assessment and compliance.

As the integration of infrastructure at a continental level expands, the capacity of African countries to collectively influence international Technical Infrastructure

standard-setting needs to be strengthened. The pivotal role of ARSO, AFSEC, AFRIMETS and AFRAC in this regard needs to be strengthened, in particular in support of implementation of the Continental Free Trade Area (CFTA).

The dumping of cheap, sub-standard manufactured goods on African markets has sometimes led to the collapse of local industries and acted as a major barrier to industrial development. Tightened implementation of appropriate standards and increased capacity to perform effective conformity assessment, market surveillance and inspection are therefore of immense importance in preventing the influx of sub-standard and injurious products into African markets.

Regional trade is key to growing the South African economy and standards are central to market access. South Africa is committed to the African developmental agenda as articulated in the National Development Plan (NDP) and IPAP. To this end, SABS is committed to actively participating and supporting the African Regional Standardisation Organisation (ARSO) and the African Electrotechnical Standardisation Commission (AFSEC); the key issue here being harmonisation of standards as one of the key levers for growing intra-African trade.

SABS will also use its CASCO Chairmanship to establish the regional conformity assessment platform. Similarly, NMISA, NRCS, SANAS and **the dti** are playing a leading role in the advancement of the technical infrastructure within SADC and across the continent. This is reflected in the hosting and support of the Secretariats of AFRIMETS (NMISA/NRCS), AFSEC (SABS), AFRAC (SANAS), SADC MET (NMISA), SADC MEL (NRCS), SADCAS (SANAS), SADC CTRLC (**the dti**).

Targeted Outcome

Increased trade and access to regional and international markets through improved quality and enhanced potential access of African products to export markets.

South Africa is the current Chairperson of SADC and BRICS and as such will be leading various Technical Infrastructure initiatives in 2018. This will include the hosting of the Annual SADC Technical Barriers to Trade Structure meeting in South Africa in March 2018.

Key milestones

- 2018/19 Q1: Lead the establishment of African CASCO platform.
- 2018/19 Q1-Q4: Report on the opportunities for harmonisation of SABS standards with those of ARSO, AFSEC and SADCSTAN.
- 2018/19 Q1-Q4: AFRAC to obtain recognised international Regional Accreditation Cooperation status within ILAC and IAF Mutual Recognition Arrangements.
- 2018/19 Q1-Q4: Develop and implement the BRICS TBT cooperation framework initiatives in support of South-South trade.
- 2018/19 Q2: African Food Safety Workshop on Standards and Methods of Analysis for Mycotoxins and Related Contaminants.
- 2018/19 Q1-Q4: Implement the SADC MET and AFRIMETS Five-Year Strategic Plan aimed at building capacity and strengthening the region's NMI in support of the SADC and African Industrialisation Strategy and Roadmap and TBTs.
- 2018/19 Q1-Q4: Implement the AFRAC and SADCA Five-Year Strategic Plan aimed at building capacity and strengthening AFRAC and SADCA in support of the SADC Industrialisation Strategy and the Tripartite and Continental Free Trade Areas objectives.
- 2018/19 Q4: Support the development and publication of AFSEC guides for application for standards that support integration of regional infrastructure. Projects for the period under consideration include: (a) Guide for Application of Standards for Rural Electrification in Africa (Revision); and (b) Guide for Application of Standards for Electricity Metering Systems in Africa.
- 2019/20 Q1-Q4: Develop AFRIMETS strategy for supporting the Continental Free Trade Area (CFTA).

Lead departments/agencies: **the dti**, EDD, NMISA, NRCS, SABS and SANAS

Supporting Departments/agencies: NT

20. Ongoing developmental tariff reform: ITAC

Nature and purpose of the intervention

With current persistent high levels of unemployment, tariffs should be selectively used, taking their possible impact on employment carefully into account. Based on the dynamics of each industrial sector, tariff investigations are carried out on a case-

by-case basis - and in accordance with World Trade Organisation (WTO) rules and consistent with South African industrial policy, legislation and regulations.

Targeted outcomes

Reduce input costs for downstream value-adding manufacturers, leading to improved competitiveness through further downstream value-addition and increased manufacturing sector employment.

Key milestones

- 2018/19 – 2020/21 Ongoing development of tariff reform in support of downstream value-adding activities; consideration of company applications to ITAC for selective tariff increases on commodities with considerable prospective for preservation and job creation.

Lead departments/agencies: **the dti**, EDD, ITAC

Supporting departments/agencies: Industry Associations, Export Councils, SARS, NT

21. Clampdown on the illicit economy, customs fraud, illegal imports and sub-standard products

Nature and purpose of the intervention

On-going interventions relating to the illicit economy, customs fraud-related issues, illegal imports and sub-standard products, and enforcement of the legislative framework.

Illegal imports are characterised by undervaluation, false declarations (origin and tariff), stage consignments, rerouting via third countries and misuse of duty rebates and credits. The scope of the illicit economy is enormous and hampers the growth of both the domestic and the global economy, whilst also threatening good governance and social stability.

Research has indicated that the cost to the global economy of counterfeiting alone reached USD 1.77 trillion in 2015 and it is estimated that the shadow economy in 2014 was \$650 billion per annum in the US.

Persistent illicit trade has a deeply detrimental impact on the South African economy. According to the State Security Agency (SSA) the South African economy is losing an estimated 10% of its GDP, or R178 billion a year, to the illicit economy. Industry sectors which are mostly affected by this are:

- clothing and footwear (including importation of second-hand clothing);
- audio-visual (music, motion pictures, CDs, DVDs & software, plastics, electro-technical components);
- automotives (engine parts, body panels, tires, filters, etc.);
- chemicals/pesticides (insecticides, herbicides, fungicides, non-stick coatings) and pharmaceuticals (medicines used for treating cancer, HIV, malaria, diabetes, hypertension, cholesterol, cardiovascular disease, obesity, infectious diseases).

The illicit economy has a major impact on the viability of South Africa's economic growth path. It is costing the country thousands of jobs, creating unfair competition to legitimate businesses and industries, eroding the corporate tax base and distorting trade.

Counter-interventions to tackle customs fraud issues include a Key Industries Forum (which meets twice a year) and a Tyre and Plastics Industry Forum (which meets quarterly). These oversight bodies will be significantly strengthened by the recently established Nedlac Task Team on Customs Fraud.

Targeted outcomes

A significant reduction in customs fraud, in support of increased industrial development and competitiveness.

Key milestones

2018/19 Q1-Q4: Closer cooperation between **the dti**, SARS, NCRS and various sectoral industry forums to address all types of custom fraud.

Lead departments/agencies: SARS, **the dti**, EDD

Supporting departments/agencies: **the dti**, SAPS, NCRS, SABS, Unions

4. African integration and industrial development



Situational analysis

The general challenge of African commodity resource dependence has been brought into stark relief by the oil and minerals price fluctuations of the past 10 years. African governments across the board are now focusing on mechanisms to diversify their domestic economies. This is reflected in the many new industrial strategies being developed, the use of local content mechanisms to encourage local manufacturing and the use of trade policy measures to protect fledgling industries. These trends have also been reflected at a regional economic community (REC) level, through regional integration initiatives and the formulation of collaborative industrialisation strategies.

South Africa has been heavily involved in integration efforts at a REC level, through the Tripartite Free Trade Area (TFTA) negotiations and ultimately through the Continental FTA.

With inter-regional trade at only 12%, the focus on creating a more powerful regional market in an increasingly contested international trading environment is seen as particularly important.

The creation of larger regional markets with fewer barriers to trade is also seen as the key to unlocking Africa's industrialisation ambitions, allowing greater economies of scale to flourish, helping to break out of the grip of commodity dependence and transforming Africa into a more sophisticated and technologically advanced region.

South Africa, as the most industrialised economy on the continent, is a key player in facilitating the industrialisation of the region, primarily within SADC (and to a slightly lesser extent, across sub-Saharan Africa as a whole). Its advanced capital markets, large corporates, long-established development finance institutions (DFIs) and the depth of its industrial and engineering capabilities have the potential to play a critical role in uplifting the region. As a contributing member state, South Africa has been instrumental in the development of the SADC Industrialisation Strategy and Action Plan – an ambitious programme focused on activating regional value-chains and strengthening key enabling institutions.

The challenge is now to move rapidly into the implementation phase, in close co-operation with leading private sector players. This was expressed at the 2017 SADC Summit theme hosted in South Africa, "Partnering with the private sector in developing industry and regional value chains". The true test, however, will be whether the member states can create the necessary conditions to attract large-scale private sector investment into productive activities at the domestic, regional and international levels.

These "necessary conditions" include, amongst others:

- a focus on enabling infrastructure and resolving border issues;
- the development of appropriate industrial skills;
- the enhancement of R&D capabilities;
- the deepening of value-chains (around agriculture, mining and pharmaceuticals particularly);
- the development of SMMEs and local clusters of competency. A detailed implementation plan prioritising the key interventions is in the process of being

rolled out by the SADC Secretariat. Member-state buy-in to these projects and programmes is being left to a demand-led process that is flexible and can be tailored to the needs of each member-state.

Through the establishment in 2016 of a new vehicle, Trade and Invest Africa (TIA), South Africa is gearing up to play the strategic role expected of it by many of its regional neighbours.

Relations are being strengthened at a bi-lateral and multi-lateral level. Investment opportunities are being analysed and prioritised in terms of both enabling infrastructure and productive activities.

Stronger coordination and cooperation measures have been put in place between government departments, leading South African private sector players, SOEs and DFIs; and these have already begun to produce better-aligned initiatives.

At over R300 billion, the rest of Africa (RoA) now represents 26.2% of South Africa's total goods exports; marginally behind exports to Asia. The significant difference, however, is that exports to Africa comprise a high percentage (over 50%) of finished and intermediate products. If one includes trade in services (which will be proportionally higher for Africa than other regional trading blocs) the African region is arguably South Africa's most important regional market.

The regional trading relationship is, however, highly skewed in South Africa's favour (at an approximate ratio of 3:1) with South African imports (of just over R100 billion) being mostly composed of raw materials, particularly oil. This has led to increasing concern in many countries that South African imports have had a detrimental impact on small and micro players, who are being squeezed out of their domestic market positions while big South African firms do little to invest in skills and local capacity-building.

The imperative is therefore for South African companies to switch from a straight trade play to investing in local production; or at least developing joint ventures with local players. The South African government, along with its SOCs and DFIs, must play a more co-ordinated developmental role: one that is long term in nature, appropriately sequenced and – critically – "crowds-in" local and foreign investors.

With this in mind, **the dti** is putting increasing emphasis on South African companies establishing more permanent positions in markets in which they operate in Africa and identifying long term win-win opportunities for investment and mutually-beneficial development.

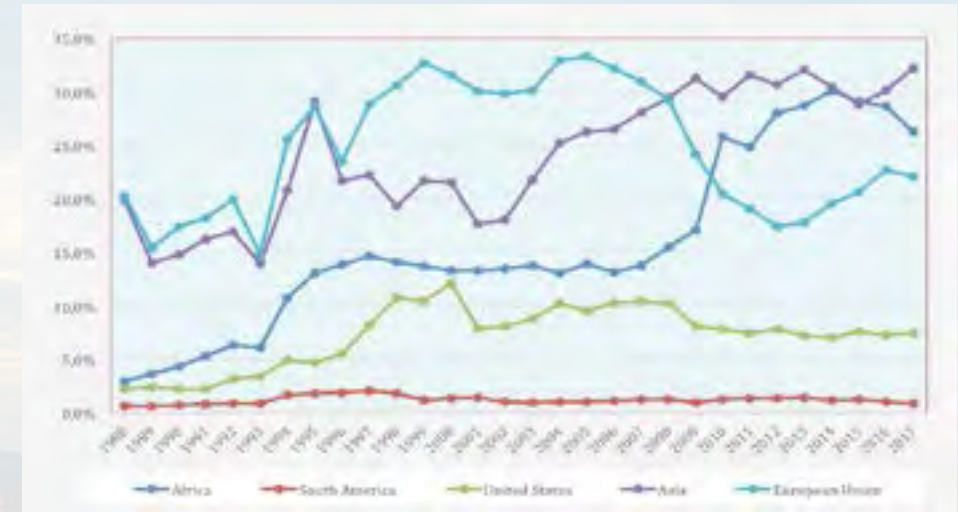
The key opportunities for South Africa lie in agriculture and agro-processing - where South Africa has strong capabilities across the full value-chain - and in specific mining and manufacturing value-chains.

Apart from direct opportunities for increased trade in products (much of which has been facilitated through South African retailers and services) a new, more developmental approach is needed, which will see South African firms playing a more co-ordinated role (through public-private partnerships) in investing in productive capabilities.

This could entail the unlocking of untapped natural resources and stranded assets in mining, agriculture and forestry, or through direct investments in manufacturing operations across the region.

As illustrated in Figure 1 below, the RoA's share of South African exports rose dramatically between 2008 and 2014 but has subsequently been in decline relative to other export destinations – in particular Asia. This can be explained both by economic crises in a number of our key African trading partners and by the steady rise in largely mineral commodity prices which has boosted the share of exports to Asia.

Figure 1. SA share of exports to the RoA: 1988–2017



Source: Quantec

As indicated in Figure 2 below, the most important RoA export markets for South Africa are Botswana and Namibia, which are part of SACU (Southern African Customs Union) – followed by Mozambique, Zambia and Zimbabwe. In total these countries absorb nearly 65% of total exports to the RoA. All these markets (except perhaps Namibia) are still heavily dependent on agricultural or mineral commodities and are therefore exposed to risk when markets turn.

The fact that South Africa itself is far from immune to the resource dependency risk only serves to point to the need for South Africa to support efforts to transform and diversify neighbouring economies, as a matter of evident mutual interest.

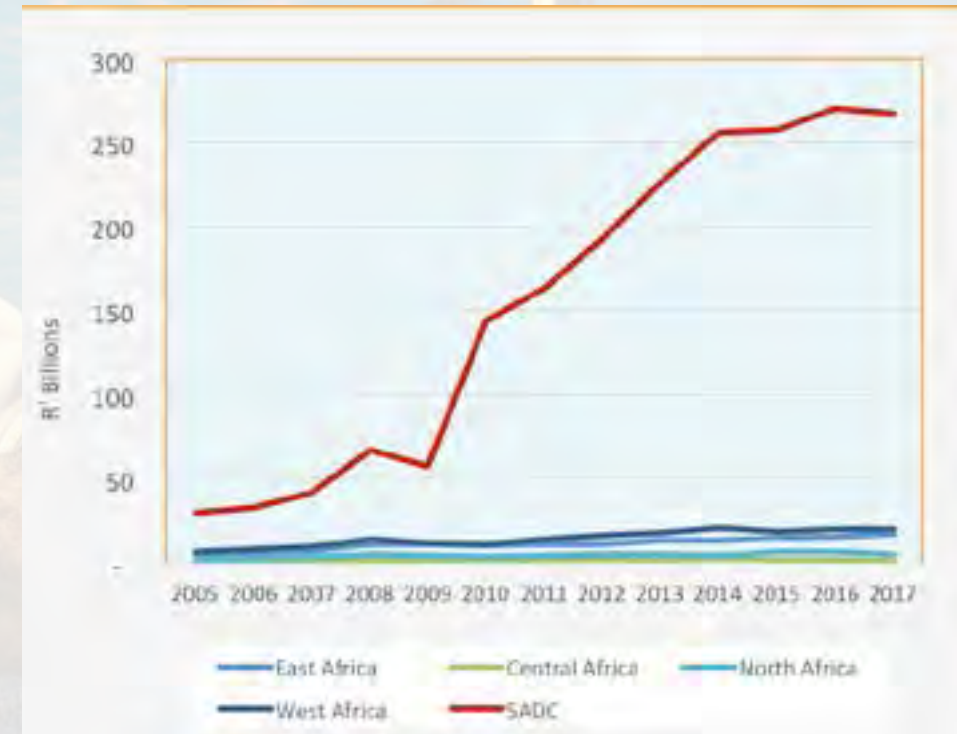
Figure 2. Top markets in the RoA



Source: Quantec

Figure 3 below shows the dramatic rise in the importance of SADC as a regional bloc relative to the other blocs in West, North, Central, East and the Indian Ocean islands. The strategic question moving ahead is whether this trend will continue or whether opportunities are now saturated, and better growth prospects could be found in the other blocs. The challenge is that while exports are still rising to SADC countries, market share in several areas such as capital goods is now in decline, with increasing competition from Asian exporters in particular.

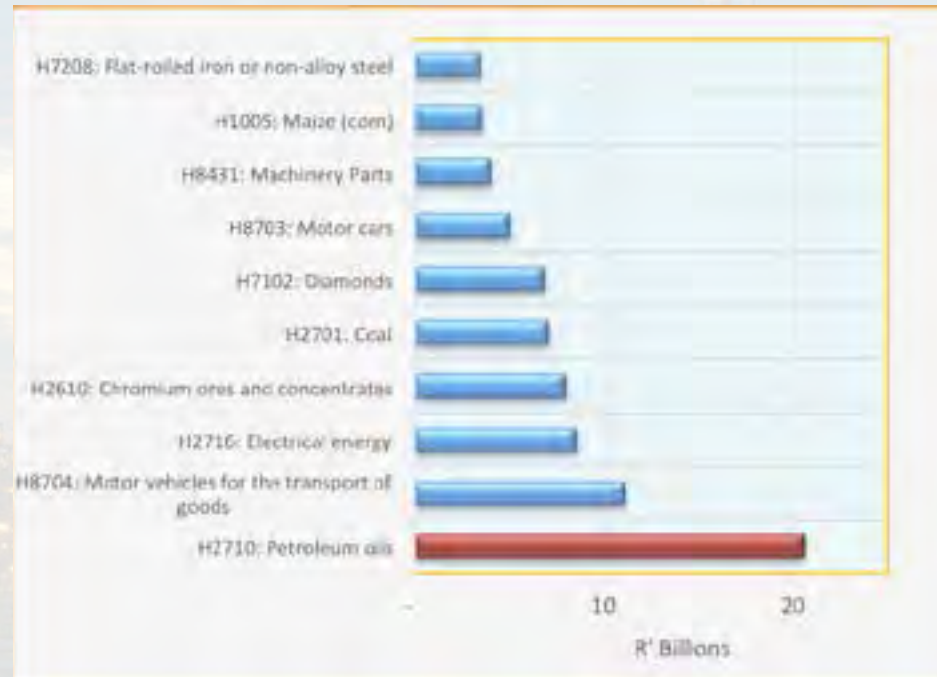
Figure 3. The rising share of exports to SADC relative to other blocs in Africa



Source: Quantec (2017)

Figure 4 below reflects the fuel imports and commodities that flow into South Africa and the export of motor vehicles and other manufactured products that make up its export basket to the region.

Figure 4. Top Sectors traded with the RoA 2017

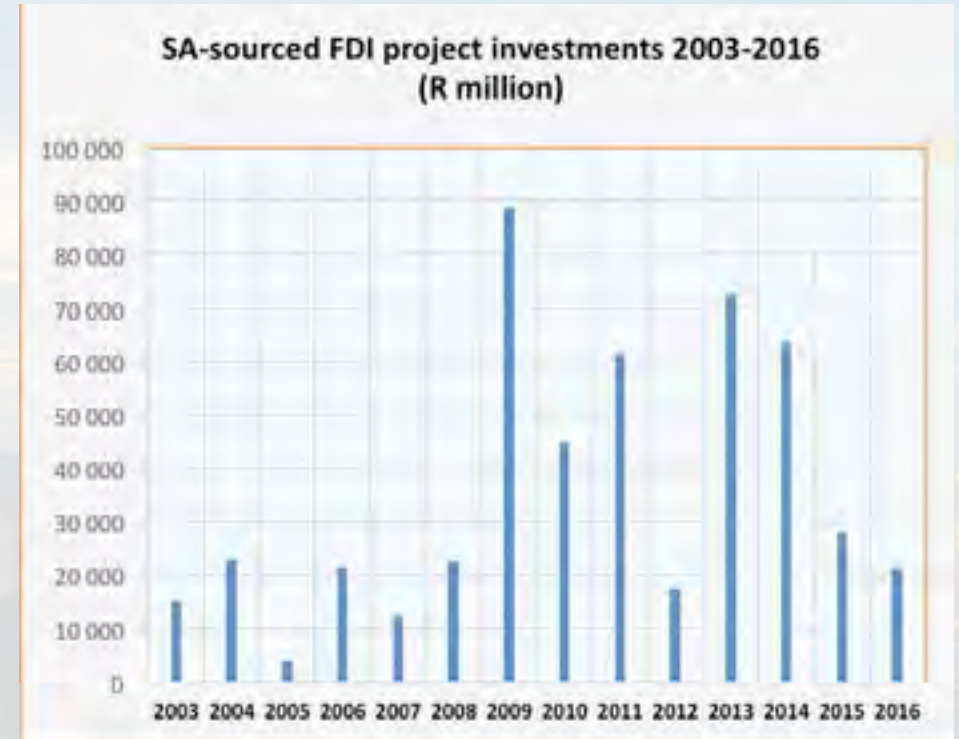


Source: Quantec

the dti is now strengthening its capacity to work with and encourage local industry players to enhance their profile on the continent and, where appropriate, to establish long-term productive project investments in-country.

As can be seen from Figure 5 below, slowing investment levels in the past two years show that there remains much work to be done.

Figure 5. SA investment into the continent: by total annual value



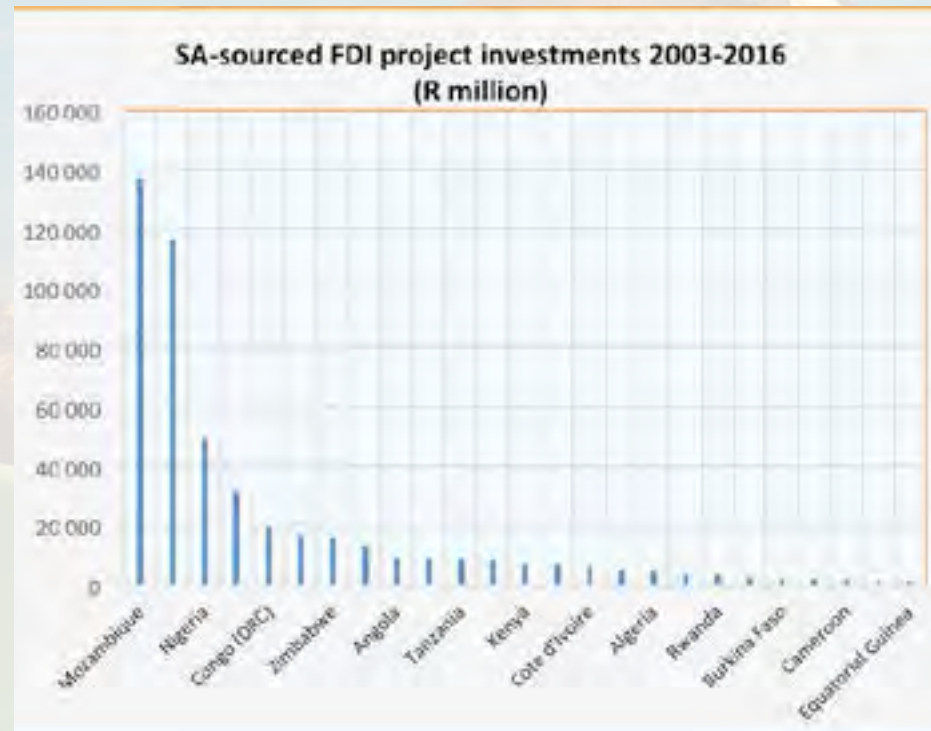
Source: FDI (Financial Times) Database

TIA will thus increasingly focus on investment-led strategies that actively partner with South African business and facilitate a collaborative approach to regional and continental engagement.

More specifically, the dti is currently focusing on identifying a limited number of strategic, long term developmental “mega-opportunities”. Their success will be premised on stronger alignment of government department initiatives, the deepening of bilateral relationships with prioritised member states, strategic support for lead firms, the “packaging” of South African financial offerings and facilitation of the necessary infrastructure to underpin capacity building across the region.

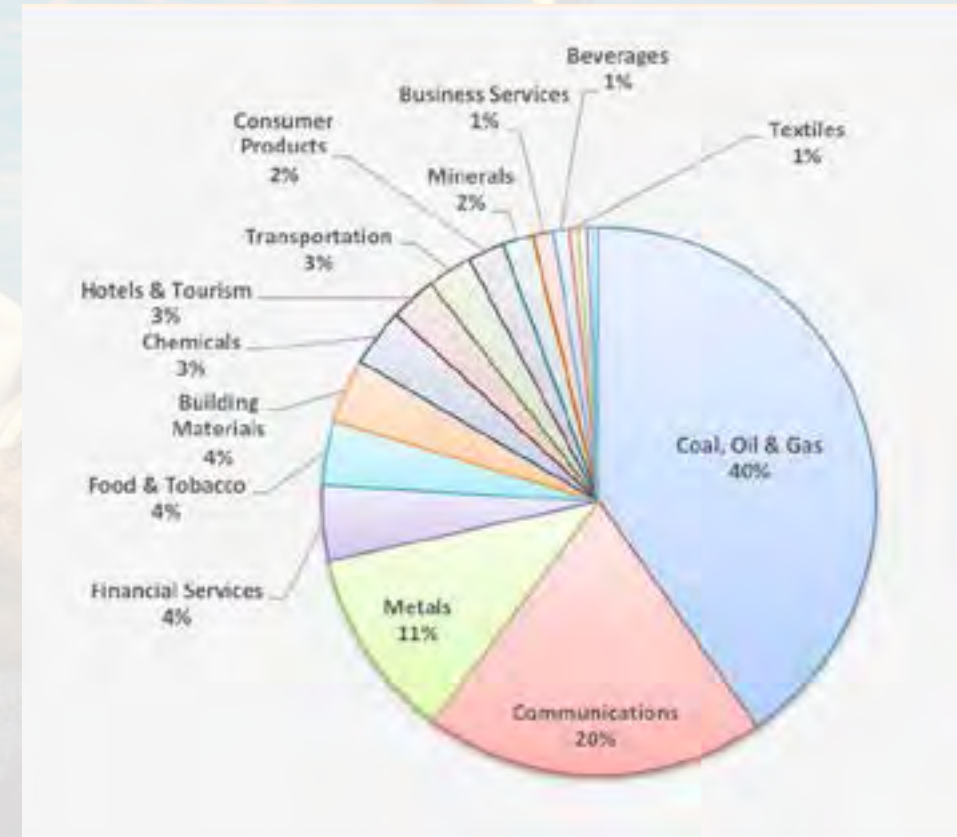
Figures 6 and 7 below indicate where the majority of the SA outward investment projects have been taking place, and in which major sectors.

Figure 6. SA investment into the continent: by major recipient countries



Source: FDI (Financial Times) Database

Figure 7. SA investment into the continent (2003 – 16): by sector share.



Source: FDI (Financial Times) Database

In working with leading globally competitive companies as the spearheads behind which a host of infrastructural and supplier opportunities can be developed, **the dti** will focus on a number of key sectors.

South Africa's competitive advantage in mining and commercial agriculture has not been fully exploited on the continent and will form the central focus for the strategy. Secondary opportunities exist in the oil and gas sector and in infrastructural services into port, rail, water reticulation and energy distribution.

The development of Africa's automotive sector in key hubs such as Kenya and Nigeria opens up a further important area of potential collaboration; while another area of opportunity to be explored is the establishment of production hubs for materials and services going into the provision of urban infrastructure and construction projects in what are some of the fastest growing cities in the world.

Finally, ongoing work is taking place around the harmonisation of pharmaceutical standards to open up economies of scale that will allow regional pharmaceutical production to take off.

Key Action Programmes

1. Supporting the industrialisation initiatives of the regional economic communities

Nature and purpose of the intervention

The adoption of the SADC Industrial Strategy and Action Plan in March 2017 was an important milestone for the region. South Africa, as an important member of the Regional Economic Communities (REC) played a key role in the successful roll-out of the Action Plan. As the current chair of the SADC Summit, it is expected by many member states that South Africa should play a greater role in strengthening and influencing the roll-out of the plan and ensuring that it achieves the impact that it is capable of. It therefore has a particular responsibility to encourage innovative initiatives and collaborative investments by both the state and the private sector. There is a wide range of relatively well-capacitated institutions in South Africa that could provide support to strengthening capacities across the region.

the dti will continue to support the industrialisation agenda of the Continental Free Trade Area (CFTA) as well as the Tripartite Free Trade Area (TFTA) - although the focus is still very much on finalising the trade negotiations. Progress will largely be dictated by the regional trade and integration efforts of the various work streams. The unit will also provide input into the SACU industrialisation agenda where appropriate.

Targeted outcomes

The initiation and delivery of key projects under the SADC Industrialisation Action Plan.

Key milestones

- | | |
|---------------|--|
| 2018/19 - Q1: | Support the SADC Secretariat in the initiation of at least 3 key programmes under the Action Plan. |
| 2018/19 - Q4: | Show demonstrable delivery in at least 3 of the key programmes under the SADC Action Plan. |

Lead departments/agencies: **the dti**, IDC, DBSA and DIRCO

2. Building an African industrial development knowledge repository, managing value chain research and supporting capacity-building across the continent

Nature and purpose of the intervention

This intervention seeks to build on existing research and knowledge across the region and will actively seek to build new, stronger collaborative networks. Through the identification of key opportunities and gaps, research will be commissioned into both value chains and other critical issues pertaining to the development of regional industrial development. An important development will be to carry out discrete deep-dive studies into specific recommendations emerging from the value-chain research. These studies may be of a policy nature or may be costed pre-feasibility studies that allow government to allocate resources to facilitate private sector investments.

The intervention will also actively promote sharing of best practice and capacity-building across the continent, through the strengthening of a regional research network facilitated by Trade and Industrial Policy Strategies (TIPS). A further intervention in strengthening capacity across the region is the expansion of a successful pilot project based on "APORDE" (Africa Programme on Rethinking Development Economics) that will target key industrial policy officials across the region. This initiative - first held in 2017 - is called *Industrial Policy for Policy Makers* (IPPM) and was attended by a cross-section of officials from the SADC region. The call by the United Nations

Economic Commission for Africa (UNECA) to develop “smart states” to facilitate industrialisation will be a key objective to be pursued within relevant government departments.

Data scarcity across the African continent is a significant challenge. To enable effective policy development, it is important to strengthen knowledge resources on Africa within South Africa, and to complement this with targeted research projects aimed at high-potential projects and value-chains. It is anticipated that all research and data will be uploaded to an online platform that will act as a facilitator of a virtual community of practice. A partnership has been launched with National Treasury and UNU-WIDER (the United Nations University) around the regional programme and should significantly raise the profile and impact of regional research. This project will be delivering 10 papers a year over a 3-year period.

Targeted outcomes

Partnerships developed with leading research bodies across the continent and research projects initiated

Key milestones

- 2018/19 – Q2: Hosting of an annual conference on issues of regional development.
- 2018/19 – Q4: 3 research projects initiated into value-chains/industrial policy issues.

Lead departments/ agencies: **the dti**, EDD, TIPS, IDC, DBSA, NT, TIA

3. Cross-border Industrial Projects

Nature and purpose of the intervention

A key challenge facing African governments is the lack of available bankable industrial development projects for consideration by local or international financiers, industrial corporations or project developers. There is not necessarily a lack of finance, but rather limitations in the ability to identify and finalise potentially viable projects through

to bankable feasibility. This means that many potential projects do not progress through to the initiation phase of project development. Far stronger co-ordination between the financial community, DFIs and **the dti** is required in identifying potential projects, dealing with specific blockages early on, and then facilitating the necessary feasibility studies.

This intervention seeks to promote catalytic industrial projects across the continent that either have South African involvement and investment, or through which South African suppliers can benefit. The intervention will build on the “bid-book” of potential projects that **the dti** has developed. Once high-potential projects have reached bankability, South Africa’s position as a financial hub can be leveraged to fast-track them.

Targeted outcomes

Industrial projects identified, scoped and facilitated through to inception.

Key milestones

- 2018/19 – Q4: 10 industrial projects identified and scoped (2-page background scopings) as possibilities for detailed project preparation or feasibility studies.
- 2018/19 – Q4: Facilitate investment decisions by SA-based companies into three industrial projects across the continent.

Lead departments/agencies: **the dti**, EDD, DPE, IDC, DBSA, NT, TIA

4. Leveraging investment-led trade and industrial integration opportunities

Nature and purpose of the intervention

To encourage better alignment and impact by South African companies and institutions, **the dti** is working with a wide range of role-players to identify and prioritise a number of mega-projects on the continent, where multi-sectoral opportunities can be “crowded in” through more co-ordinated efforts. The common line often mentioned is that whereas many of our competitors go into a country together, South Africa has

not utilised the “SA inc” approach - so important to competing successfully on the continent - to anything like the full extent possible.

the dti will therefore develop and facilitate a more integrated approach in targeting key regional mega-opportunities. This will see more focus in terms of country selection and will take a developmental approach to identifying longer term opportunities and the quantum of commercial, infrastructural and skills requirements for each basket of projects. Clearly these opportunities should be developed as a set of win-win partnerships between South Africa and the relevant member states.

Targeted outcomes

The identification and scoping of key mega-projects in the region that can act as catalysts for structural transformation in the region and as a source of demand for South African products.

Key milestones

- 2018/19 Q3: Identification of two mega-projects for intensive research, relationship-building and facilitation.
- 2018/19 Q4: Orientation of the new strategy around strategic opportunities in which South Africa’s involvement can be deepened.

Lead departments/agencies: **the dti**, EDD, DPE, DST, IDC, DBSA, NT, the Presidency, TIA

5. Special Economic Zones (SEZs)



Situational Analysis

Special Economic Zones (SEZs) have proven to be an effective policy instrument for propelling industrialisation in some of the world’s leading developing economies. Substantively, the SEZ Programme underpins most of China’s current manufacturing capacity, and this has enabled it to be, amongst other things, a highly-competitive net exporter of value-added goods.

Through its more than 200 SEZs, China has been able to sustain a positive trading account for a protracted period of time. Moreover, the SEZ Programme has contributed immensely towards gainful job creation in that country. A similar trend is emerging in some African countries: Ethiopia, Kenya, Zambia, Botswana and Nigeria have all begun to develop and implement pro-industrialisation policy initiatives.

With an eye to international trends, the South African government has also sought to employ the SEZ policy instrument - with the following defined objectives:

- Promotion of the mastery of targeted industrial capabilities within the framework of the IPAP and the NDP.

- Promotion of beneficiation and value-addition to the country's minerals and other natural resources.
- Development of the world-class infrastructure required to support the development of the targeted industrial activities.
- Attraction of foreign and domestic direct investment.
- Acceleration of economic growth and the creation of much needed jobs.

Over the past few years, work in this programme has focused on the design of a regulatory framework for effective design, planning, development and management of zones. This included the introduction of a package of incentives for qualifying investments located within designated zones and undertaking feasibility studies to determine the long-term economic viability of proposed new zones.

The current work package for the SEZ Programme is mainly centred on the following: a) designation of new SEZs; b) compliance with legislation; c) investment promotion and marketing; d) infrastructure development; e) institutional development; f) capacity-building; and g) stakeholder management.

Key Action Programmes

1. Designation of Special Economic Zones

Nature and purpose of the intervention

The designation of an area as a Special Economic Zone to authorise the applicant to develop the zone. The formal assessment of applications for designations, determination of economically viable zones and authorisation of the development of a special economic zone in a specific region of the country.

The application includes, amongst other things, feasibility studies, environmental authorisation, land approvals, business plan, investment attraction strategy and commitments from various critical stakeholders.

In terms of the SEZ legislation, the power to designate an area as a Special Economic

Zone is vested in the Minister of Trade and Industry. The Minister, however, receives advice from the SEZ Advisory Board, confers with the Minister of Finance and seeks the concurrence of Cabinet.

Targeted outcomes

Identification and approval of high-impact, economically viable SEZ projects, developed and properly managed to significantly contribute to the attraction of foreign and domestic direct investment, building of targeted industries, and development of new industrial hubs.

Key milestones

2018 Q 1:	Review of one application for designation by the Secretariat and Technical Subcommittee of the Board.
2018 Q 2:	Review of the application by the full Board.
2018 Q 3:	Gazette notice published for public comments.
2018 Q 4:	Designation.

2. Institutional and capacity development

Nature and purpose of the intervention

The one conspicuous challenge in relation to the development of the SEZs is the capacity constraint with respect to the technical know-how among development practitioners across the three spheres of government. Lessons from international experience suggest that the success of an SEZ Programme depends on the capacity of implementing agencies to plan, design, develop, manage and operate the zones. Continuous institution- and capacity-building is therefore necessary for the success of any SEZ Programme.

Given this context, the South African government (through **the dti**) has entered into a five-year Agreement with China with a view to creating a platform for Chinese officials to share their valuable SEZ experience, thus better equipping South Africa's policy-makers, development practitioners and operators with the required planning, technical, managerial and operational know-how.

To date, 120 representatives from National and Provincial Government Departments and Provincial Development Agencies have benefitted from the Chinese training programme.

Targeted outcomes

A larger pool of skills and expertise available locally to contribute to the planning, design, development, and management of Special Economic Zones.

Key milestones

- 2018 Q 1: Recruitment of further candidates for SEZ training in China.
- 2018 Q 2: Training in China taking place.
- 2018 Q 3: Report on the training in China approved.

3. Marketing Plan for Special Economic Zones

Nature of intervention

Marketing and Promotion of the SEZ is one of the critical pillars of the SEZ. This is mainly used to promote South African Special Economic Zones opportunities both locally and internationally. The marketing and promotion of SEZ are implemented through strategic partnerships with internal and external stakeholders such as TISA, ISA, ITED, Embassies, FDIs, and designated SEZs.

Clear communication with investors on the investment opportunities and incentives available in the special economic zones is vital for the success of the zones. This requires clear packaging of investment opportunities and clear strategies and programme for engaging the targeted domestic and foreign investors.

Targeted outcomes

Increased awareness that would in turn increase both domestic and foreign investments.

Key milestones

Quarterly Milestones: one Investment mission per quarter.

6. Innovation & Technology

(Chapter provided by the Department of Science & Technology)

PROTECTING INTELLECTUAL PROPERTY FROM PUBLICLY-FINANCED RESEARCH AND DEVELOPMENT THROUGH THE NATIONAL INTELLECTUAL PROPERTY MANAGEMENT OFFICE (NIPMO)



NIPMO was established in terms of the Intellectual Property Rights from Publicly Financed Research and Development Act (IPR Act; No. 51 of 2008). The scope of this piece of legislation is to ensure that intellectual property (IP) emanating from publicly financed research and development is identified, protected, utilised and commercialised for the benefit of the people of the Republic, whether it be for socio- economic and/or other impacts.

Figure 1. The pathway for the transfer of technology (embodying intellectual property) from a research institution to an existing company or a start-up to create impact - including jobs, improvement in the quality of life of individuals and contribution towards GDP



Source: The DST

Progress in ensuring that new technologies developed by our higher education institutions and science councils can be tracked through various key indicators including:

- The number of new disclosures (new IP creations such as an invention) made by researchers to their office of technology transfer at an institution has increased from 2008 to 2014 (Figure 2).
- The number of patent applications filed by institutions. (Figure 3) - where the number of new patent applications filed increased more rapidly than the increase in research expenditure over the period 2008 to 2014;
- The number of licensing agreements concluded granting an existing company or a start-up company rights to use the IP (Figure 4); where the number quadrupled over the period of 2008 to 2014. Furthermore, 45 start-up companies were formed over the period to commercialise an institution's technology, 73% of which were based on publicly-funded IP. From 2010 to 2014 the total number of FTEs employed in start-up companies originating from higher education institutions grew by 29%, from 238 to 308.

- Revenue collected by an institution for the use of its IP was, on average, R32.9 million per year (Figure 5). Of significance is that more than 88% of this revenue accrued consistently each year to the same four institutions that have well-established TTFs. Most IP transactions yielded less than R100,000 per year.

Figure 2. The number of disclosures²



Figure 20: Number of disclosures received

Data note | n = 22

² PLEASE NOTE: The data in charts 2-5 is the most recent to hand. A further major update review is to be carried out in 2018, for release in early 2019.

Figure 3. The number of new patent applications

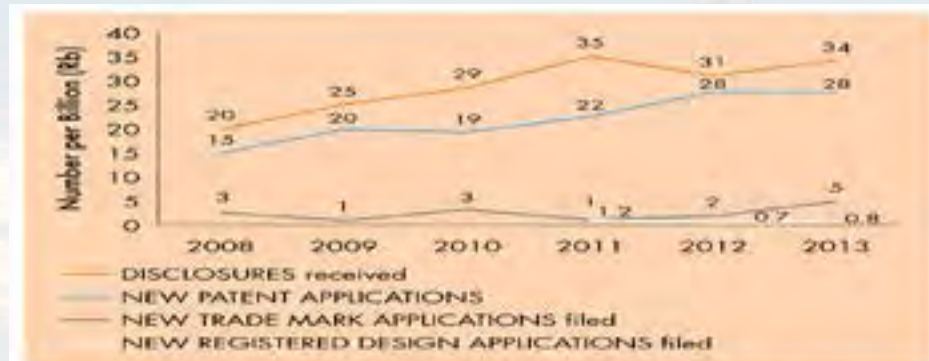


Figure 32: IP related activities per Billion Rand of institutional research expenditure in constant 2010 prices

Data note | n = 21
*Plant Breeders' Rights data was not included due to insufficient data.

Figure 4. Licence agreements concluded



Figure 34: Number of licences executed in a particular year

Data note | n = 22
Data was unavailable from one major contributor, which means that this series is under-estimated.

Figure 5. Revenue received by institutions from their licensed IP

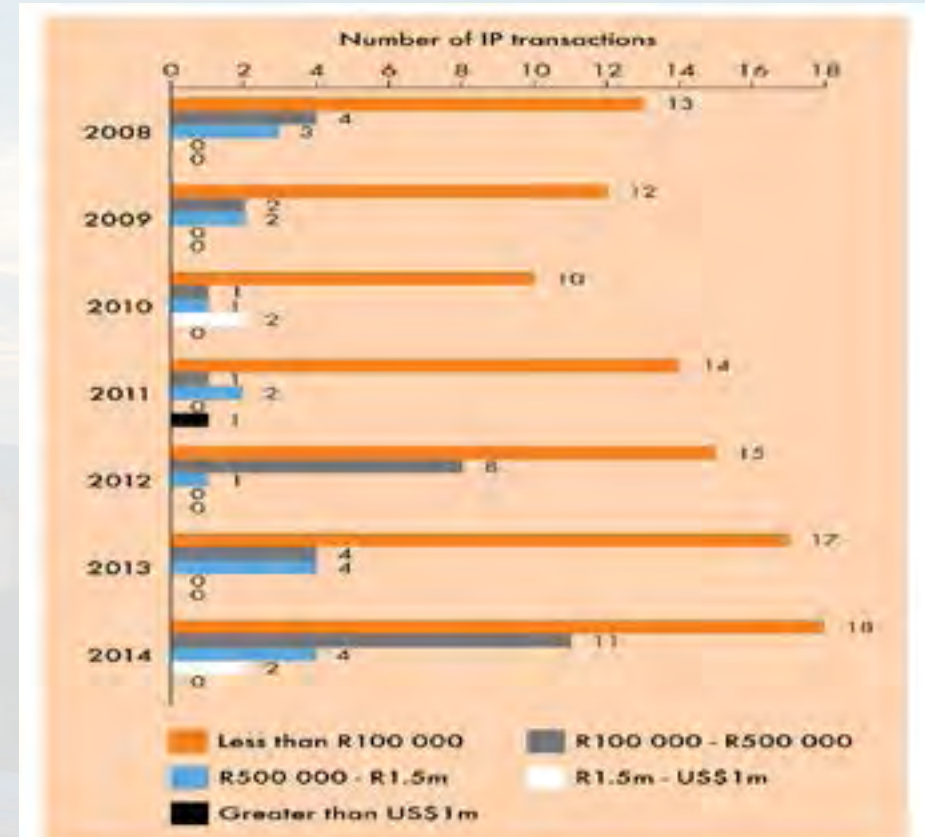


Figure 37: Number of IP transactions yielding revenue in five revenue brackets

Data note | n = 20
The Rand equivalent of US\$1m was obtained from purchasing power parity (PPP) estimates for South Africa from the Organisation for Economic Cooperation and Development (OECD) website (<http://data.oecd.org/conversion/purchasing-power-parities-ppp.htm>, accessed 2015/02/19). See Table 3.
Data was not available from at least one major contributor, which means that this series is an under-estimate.

SCIENCE AND TECHNOLOGY

The landscape of the South African National System of Innovation (NSI) has also developed over the last ten years, with the milestones indicated in the schematic below. The green hexagons indicate new institutions which were established over this period.

Figure 6. South African SET policy and institutional trajectory



Source: The DST

The next major milestones in the NSI is the update of the White Paper on Science and Technology, followed by the development of the Decadal Plan which will replace/update the Ten-Year Innovation Plan (2008 – 2018).

1. DEVELOPMENT OF THE WHITE PAPER ON SCIENCE & TECHNOLOGY

Since the adoption of the 1996 White Paper on Science and Technology 20 years ago, the STI environment has seen significant shifts that require an updated policy response from South Africa. The White Paper on Science, Technology and Innovation, currently under development, and scheduled for completion during the 2018/19 financial year, seeks to achieve the following:

- Based on an evaluation of progress across the NSI over the past 20 years, retain and intensify policy approaches that are delivering good results, and where necessary, adopt new approaches.

- Address the risks and position South Africa to benefit from the opportunities presented by megatrends such as urbanisation, environmental degradation, increasing role for digital technologies and ICTs, as well as the Digital Industrial Revolution.
- Put strategies in place to ensure that the NSI becomes more inclusive.

In recognition of the fact that improved innovation performance is dependent on partnerships, the White Paper is aimed at fostering innovation ecosystems at all levels in the NSI. This will be done through inter alia, the purposeful inclusion of both business and civil society in the identification of STI priorities, the implementation of programmes locally and an intensified focus on linking with African (and other international) STI programmes and entrepreneurs. To improve the functioning of the NSI and the full realisation of the benefits of STI, the White Paper also proposes mechanisms to improve the coordination and governance of STI programmes across government and the NSI. For instance, the White Paper proposes a “whole-of-government” approach to innovation policy (e.g. harmonising policies that impact on innovation and aligning incentives across government).

Fundamental to improving the functioning of the NSI is the need to build on progress in knowledge generation and to increase the rapid diffusion of knowledge, as well as to significantly expand the human capital base of the economy (in both technical and academic disciplines) and to support would-be technology-based entrepreneurs.

In addition to measures to address these needs, the White Paper places further emphasis on transformation of the economy through the utilisation of publicly funded Intellectual Property to develop new black-owned technology-based firms. For innovation and entrepreneurship to become pervasive throughout South African society, the White Paper focuses on expanding the Public Engagement with Science programme, amongst others.

The NSI is underfunded and both business confidence and the fiscal situation have not been conducive to increased investment in STI over the recent past. Therefore, the White Paper prioritises mechanisms to attract greater STI investment. Examples are an evidence-based STI investment framework supported by the National Treasury and the rest of government, and new approaches to the selection of technology focus areas that would improve the productivity of public STI investment and attract private sector investment across the NSI.

**2. SCIENCE AND TECHNOLOGY INNOVATION (STI) AND ECONOMIC GROWTH:
SA POLICY CONTEXT AND COORDINATION**

2.1. Investment in knowledge generation

The focus on increased knowledge generation is aimed at restoring, transforming and building the human pipeline in research and development (R&D). An increase in the pool of knowledge workers is one of the key enablers towards ensuring new technological knowledge, opportunities to develop new technologies and higher levels of contribution to sustained industrial competitiveness.

Expanding knowledge generation/production capacity is essential for increased efficiency gains across the economy. The target is to substantially increase the Gross Expenditure on R&D (GERD) as a percentage of the Gross Domestic Product (GDP). After being static at 0,73% of GDP, the latest measurement indicates an increase to 0,77% and then to 0,8%, as indicated in Figure 6 below. Despite the small changes indicated in this Figure, this is the fifth consecutive year that GERD as % of GDP has increased in constant 2010 Rand values.

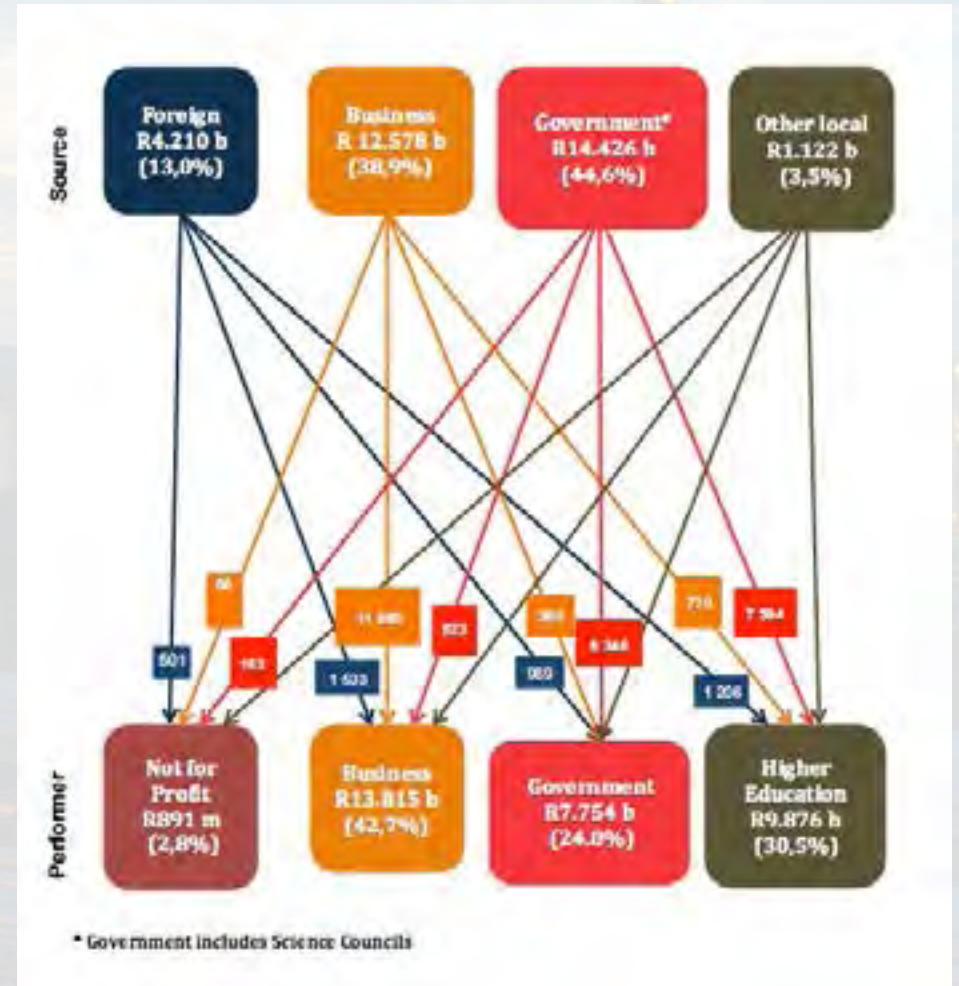
Figure 7. GERD as a % of GDP



Source: The DST

The sources of R&D funding and the various entities performing R&D are indicated in Figure 8 below.

Figure 8. R&D funding flow diagram



Source: The DST

The trends in business expenditure on R&D (BERD) for various sectors are given in Figure 9 below.

Figure 9. Business expenditure by sector (R' 000)



Source: The DST

2.2. Technology absorption and diffusion

In further support of technology transfer, diffusion and absorption, the DST has initiated the biennial Innovation Bridge (IB) technology showcase and matchmaking event. IB is aimed at enabling linkages and networking between South African, regional and international innovators, industry and public and private technology development and commercialisation funding partners.

The inaugural IB event was held in 2015 and was aimed at encouraging and accelerating the utilisation and commercialisation of existing and new knowledge and technologies that have been developed in South African research and technology development institutions. At that time, over 90 innovations, from 37 publicly-funded organisations, were exhibited. These included the latest technologies from the country's top research and technology development support institutions, including 16 universities, 14 TIA-supported companies, 6 science councils, and the South African National Space Agency (SANSA).

The event was attended by more than 700 participants, of which: 331 were large companies and SMMEs; 78 technology financiers; 121 representatives from local, provincial and national government; 24 international participants; and 199 research organisations. Overall, the 2015 IB outcomes included 227 new collaborations and 58 unique follow-on deals in the form of partnership and funding agreements.

The second national IB event was held on 15 September 2017 and saw a 42% increase in attendance (with over 1,070 attendees registered on the day). The event also recorded an 87% increase in exhibitors with a total of 69 exhibitors showcasing over 170 innovations (compared with 37 exhibitors and 92 innovations in 2015).

It is envisaged that the third IB showcase event will be held before the end of the 2018/19 financial year.

As part of the DST's ongoing efforts to create an enabling environment to stimulate technology transfer and diffusion, the Department also launched its Innovation Bridge Portal (IBP), (see www.innovationbridge.info), at the IB

event in September 2017. The IBP serves as an online platform to encourage greater ongoing interaction between industry, academia and government, as a complementary initiative to the biennial IB technology showcase and matchmaking events.

To this end, the IBP, on a year-round basis, now effectively enables:

- the profiling and marketing of South African technology innovation competencies and products, locally and internationally;
- the facilitation of access to funding and support for researchers, technology developers and technology entrepreneurs working in the STI space;
- matchmaking between researchers, technology developers and entrepreneurs with relevant financiers and supporting entities.

Further testing and enhancements to IBP functionalities will continue throughout 2018.

2.3. Ongoing harmonisation of innovation support initiatives

In 2015 the DST finalised its Commercialisation Framework (CF) as an overarching internal policy guideline for actions that can be taken in respect of the commercialisation activities of the Department. In 2017, the Department developed and finalised the CF implementation protocols as a guide to support the implementation of the CF approach. Specifically, the Protocols are aimed at enabling the systematic gathering of relevant evidence in support of decision-making on R&D investments and the realisation of any commercialisation opportunities in this regard.

The Protocols are now available to assist and support decision-making by partners and stakeholders in technology project management and commercialisation across the NSI. This is to be achieved by enabling the systematic implementation of a standard approach to risk mitigation, including:

- the adoption of portfolio management approaches; careful balancing of projects to manage high risk/high return (radical innovation) versus low risk/low return (incremental innovation);

- the Implementation of project management practices across the Department with a view to ensuring that:
 - High-risk areas are identified early and resolved;
 - Commercialisation partnerships established, and
 - Market and SHE risks are well understood and managed.

It is envisaged that the CF implementation protocols will be shared with and, where appropriate, institutionalised through the Commercialisation Collaboration Forum (CCF).

The CCF was initiated in 2014 by the DST, together with partner organisations in the NSI, as a voluntary network of publicly-funded technology development and commercialisation funding and support organisations that contribute directly or indirectly to national technology commercialisation value chains.

Regular engagements at the CCF are intended to enable the sharing of information and best practice, as well as to enhance contact across the various government departments and entities involved in technology development and commercialisation.

Ultimately, the goal of the CCF is to develop an effective inter-departmental commercialisation collaboration strategic partnership to support the optimisation of government spending on technology development and commercialisation and to reduce any unnecessary duplication of commercialisation funding efforts.

To give effect to this goal, it is envisaged that the CCF will be formally established during the 2018/19 financial year, through nominations of representatives to serve on the CCF by the Directors-General of several government departments, and the heads of other entities including the DST, TIA, **the dti**, EDD, DSBD, SEDA, and the IDC, among others.

2.4. The Sovereign Innovation Fund

The establishment of the Sovereign Innovation Fund was endorsed at the July 2015 Cabinet Lekgotla and was included as a DST action item under the Nine-Point Plan. Subsequently the Fund was affirmed in 2016 as a national

imperative when the President, in his State of the Nation Address, announced that the DST will “... finalise the Sovereign Innovation Fund, a public-private funding partnership aimed at commercialising innovations that are from ideas from the public and the private sectors”³.

Throughout 2016 and 2017, the DST engaged with a number of government departments and stakeholders, including National Treasury (NT), **the dti**, Economic Development Department (EDD), and the Department of Small Business Development (DSBD). This was with a view to identifying the most appropriate modalities, and partnerships, towards the establishment of the Sovereign Innovation Fund (SoIF) as a public-private funding partnership aimed at harvesting and commercialising South African technology innovations for deployment in national and international markets.

NT has allocated funding of R1 billion per annum, commencing in the 2019/20 financial year, to provide support for innovation and SMEs. At present, the DST, together with the NT, DSBD and the Government Technical Advisory Centre (GTAC), is finalising recommendations, as a business case, for the initiation of the SoIF, commencing in the remainder of 2017/18 and throughout the 2018/19 financial years.

2.5. Localisation

One of the most effective demand-side innovation instruments remains the leveraging of public procurement. The DST implemented the Technology Localisation Programme (TLP) in support of government’s drive to increase the level of local production related to public (and recently, also private) procurement.

The TLP provides technological support to firms and sectors to improve their competitiveness and ability to qualify and secure contracts linked to public procurement – either directly with State Owned Companies (SOCs) or through contracting with international Original Equipment Manufacturers (OEMs) that have secured major contracts with SOCs. The programme, implemented by the Technology Localisation Implementation Unit (TLIU) hosted by the CSIR, has achieved substantial success and is increasingly being recognised as the national nodal point for supplier development and technology assistance.

The success achieved to date and the recognition of a need to further upscale the programme has resulted in its expansion to support increased local production, most notably in the mining equipment manufacturing industry.

TLP interventions are offered based on several instruments:

- Firm-level Technology Assistance Packages (FTAPs): these ensure that a third party (e.g. university or science council) provides technology assistance, such as skills, equipment, designs, manufacturing systems, etc. to an approved firm to increase its competitiveness through new or improved processes, products, and skills.
- Sector-Wide Technology Assistance Package (SWTAP): this provides technology assistance for a range of firms in a sector.
- Technology Development Grants: these provide funding to mature local technologies that might be used in local procurement.
- Experiential Training Programme: This enables predominantly P1 and P2 students to complete their practical training, thereby enabling them to complete their qualifications.
- Firm benchmarking: This assesses a firm’s management and technological capability to define development areas, but also to transfer knowledge. There are currently more than 5,800 South African manufacturing firms profiled in the database, of which more than 800 firms have been benchmarked. The database is continuously maintained and expanded with the aim of facilitating new supply chain relationships - an essential requirement both for new OEM subsystem providers (who might have secured a new contract in South Africa) and for existing, especially small, firms which might not yet be incorporated into a supply chain.

Key Action Programmes

1. Strategy for the adoption/diffusion of locally developed technologies

Nature and purpose of the intervention

The socio-economic impact of research and technology development is realised when the respective technologies are absorbed in the market or into society. During August 2016, the Lekgotla identified the need to enhance the diffusion of locally developed technologies, resulting in a request to the DST, supported by **the dti**, to develop a strategy for the diffusion of locally developed technologies. A review of available technologies, as well as government programmes where there are opportunities for the use of these technologies, has identified three initial areas of potential; namely, defence and security technologies, social infrastructure technologies and health technologies.

Phase 1 (2016/17 to 2019/20) will focus on identifying opportunities for diffusing ready or near-ready locally developed technologies arising from investments made by the DST and its entities. Arrangements are being made to interact with the relevant lead departments and agencies in these areas to finalise the procurement modalities of potential technologies by the end of the 2018/19 financial year.

In parallel to taking forward these short-term opportunities, the DST, in collaboration with **the dti** and EDD, is working on a more detailed strategy that will include looking at issues such as measures which will be required to accelerate the commercialisation of locally developed technologies as well as engagements with the private sector on new opportunities (for example, mining technologies and equipment as identified during the Mining Phakisa). The more detailed strategy is planned for finalisation and submission to Cabinet in the first half of 2017.

Due to DST staff capacity constraints, this initiative did not commence as originally planned, only kicking off in Q3 2017/18. Progress to date has mostly centred on consulting with key agencies to conceptualise selected elements of the strategy and to create awareness of the overall strategy. In addition, the approach approved by Cabinet is that the primary focus will be on government procurement, and no longer

on private sector partnerships, although this does not preclude the involvement of the private sector in the initiative.

Targeted outcomes

Increased diffusion of locally developed technologies to accelerate the creation of successful products, processes and services or social and/or economic impact.

Key milestones

2018/19 Q4: The formalisation of the strategy for the diffusion of locally developed technologies.

Lead departments / agencies: DST, **the dti**

Supporting departments / agencies: EDD, DoD, DoH, TIA, CSIR, SEDA, NIPMO, PIC

2. Science, Technology and Innovation Plan of Action in response to the Digital Industrial Revolution

Nature and purpose of the intervention

The Digital Industrial Revolution (DIR) is seen as likely to have profoundly disruptive effects in many spheres, not least of which is jobs and employment. Economic opportunities exist, but new industries are creating fewer jobs, and those jobs require advanced skills. Furthermore, technologies such as artificial intelligence and robotics may disrupt or destroy many jobs in the services sector and in labour-intensive industries. Increased digitisation will also necessitate more attention being paid to associated risks such as cybersecurity, privacy and data security.

South Africa does not of course exist in isolation, but in a hyper-connected world of social media, blockchain and networked devices. It is therefore imperative that it actively prepares and responds to take advantage of the social and economic change brought on by the DIR and mitigates against the possible negative consequences.

Economists and historians broadly acknowledge that long-run economic growth is determined primarily by productivity growth, which in turn is driven by technological change created by scientific, technological and knowledge-based capabilities. Given the imperative to develop these capabilities, the DST will develop a comprehensive long-term science, technology and innovation (STI)-based plan of action in response to the DIR.

Targeted outcomes

Consultation, deep policy learning and the development of a comprehensive long-term STI-based plan of action to address socio-economic development in the context of the DIR for the forthcoming MTEF cycle and the DST's Decadal Plan.

Key milestones

- 2018/19 Q3: Baseline study of local publicly-funded research organisations and universities; review of global academic and grey literature; coordinating and synergising existing DST R&D initiatives into a Converging Technologies Platform.
- 2019/20 Q4: A comprehensive long-term STI plan of action to address socio-economic development in the context of the DIR.

Lead departments / agencies: DST, **the dti**, EDD

Supporting departments / agencies: HSRC, CSIR, TIA, DTPS, DoL, DHET, DBE, EDD, NIPMO, NACI

3. Technology localisation

Nature and purpose of the intervention

As mentioned in the section above, the technology localisation programme is aimed at increasing the level of local production by increasing the capability and competitiveness of local firms through tailored technology assistance at both firm and sectoral level.

Besides the desired outcome of increased local production (implying retained or increased jobs and reduced imports) based on public procurement, the technology localisation approach is also being applied in non-public procurement areas such as the manufacturing of mining equipment.

Targeted outcomes

- Conclusion of inter-departmental discussions (DPE, **dti**, DoT, DPME) on the optimisation of the technology localisation programme, resulting in a single, coordinated programme to increase the level of local production, leveraged on the back of public procurement.
- In a number of developed countries, the needs expressed in a public procurement contract are also leveraged to initiate an innovation, thereby helping to introduce a new product/service to the market and also helping to increase the global competitiveness of the local sector that supports this innovation.

Key milestones

- 2018/19 Q4:
- a. A coordinated implementation agreement on how to increase the level of local production by leveraging public procurement.
 - b. A pilot project/procurement that leverages a public procurement need to initiate an innovation.

Lead departments/agencies: DST, **the dti**

Supporting departments / agencies: DPME, DPE

3.1. The CSIR and innovation-led industrial development

Situational analysis



The role of innovation in driving economic competitiveness is well established. Key national institutions and departments (DST, dti, CSIR, IDC) are exploring opportunities to improve South Africa's economic competitiveness through science and technology.

Investments in science, technology and innovation have the potential to grow the economy through a) the creation of new firms and increased competitiveness of existing firms; b) increased exports and reduced imports; c) lowering of entry barriers to create opportunities for emerging black and female entrepreneurs.

The CSIR mandate in particular calls for the organisation to foster industrial and scientific development through directed multi-disciplinary research and technological innovation to improve the quality of life of South Africans.

These key institutions have invested significantly in the development of strategies that aim to amplify the focus on industrial development. Primarily, the strategies identify sectors and value chains where South Africa can carve a competitive advantage through adoption of advances in science, engineering and technology, while leveraging our mineral and other natural resource wealth. The strategies take into account learnings from countries that are leading the digital revolution (Germany, UK, Australia, USA), but are crafted to address South Africa's unique challenges and take advantage of local and regional opportunities.

Key Action Programme

1. Bridge the gap between research, development and industrial application at pace and scale

Nature and purpose of the intervention

The CSIR and role-players in the National System of Innovation (NSI) are developing industry-facing translational research programmes and associated infrastructure to bridge the gap between research, development and industrial application at pace and scale.

This approach responds directly to the lack of large-scale industrial research and development infrastructure in the country, and **the dti** priorities of public infrastructure-driven industrialisation providing stronger support for localisation and advanced manufacturing - with a primary focus on sectors where South Africa can compete in global markets and on programmes that leverage South Africa's resource advantage.

This approach builds on the Industry Innovation Partnerships Programme (IIPF), which seeks to attract private-sector investment in translating R&D outputs into commercial products by providing specialised prototyping, piloting and upscaling infrastructure to bridge the gap between the lab and the market. It also amplifies other DST and **dti**-supported programmes like the Technology Localisation Implementation Unit, Aerospace Industry Support Initiative and the National Cleaner Production Centre.

To be successful, the initiatives must attain national level programme status; with the support of industry players (public and private), policy makers, development funding institutions and innovation partners such as universities and other research institutions, both local and international. The rationale for this approach is that all role players in the system would be required to be fully onboard for the programmes to achieve the desired impact. Thus, each initiative will be positioned as a **national strategic asset** to the sector or cluster of sectors.

The translational programmes and associated infrastructure will focus on:

- improving the supply chain competitiveness of South African SMMEs in high-value manufacturing industries such as aerospace, automotive and defence to step up exports and capture a growing share of global high-value manufacturing;
- developing advanced materials and additive manufacturing to reinforce high-value manufacturing sectors;
- establishing a bioprocess initiative harnessing advances in chemistry, synthetic biology and biotechnology to convert South Africa's resource advantage into a chemicals and materials advantage;
- catalysing local manufacturing of critical drugs through a pharmaceuticals initiative to develop and scale up production of active pharmaceutical ingredients;
- continued implementation of mining revitalisation activities under the South African Mining Extraction Research Development and Innovation (SAMERDI) initiative;
- establishment of an agro-processing programme to expand the national product portfolio, add and redistribute value for an inclusive and growing agricultural sector;
- institutionalising a collaborative Digital Industrial Revolution (Industry 4.0) initiative to capacitate the CSIR and its partners in the NSI to adopt advances in production;
- establishing a nexus initiative as a national strategic decision-support capability designed to address issues relating to the interaction between the natural environment and industrial development activities. (Addressing competing demands for natural resources such as water, waste and energy).

Targeted outcomes

The strategic programmes will aim to improve the performance of the South African economy, with a view of reversing the de-industrialisation trend. Programmes will be implemented (or continued) for improving competitiveness of small and medium enterprises (SMEs) with a view to strengthening supply chains in key economic sectors. For large and emerging industry, five cross-cutting thematic areas will apply to all the manufacturing-related initiatives, notably:

- product innovation (including a life-cycle management approach to product design);
- manufacturing process (e.g. forming, joining, machining technologies);
- manufacturing automation (includes precision measurement and automation);
- manufacturing systems (includes planning, manufacturing, execution and control, operations management etc.); and
- business model innovation.

Key milestones

- 2018/19 Q2: Support a national Digital Industrial Revolution Initiative with contribution from the private sector and civil society to support key manufacturing sectors.
- 2018/19 Q4: Support the agro-processing and high-value pharmaceuticals manufacturing initiatives.

Lead departments/agencies: CSIR, DST

Supporting departments: **the dti**, DPME, EDD, NPC, IDC, TIA

3.2. The Digital Industrial Revolution



Situational analysis

The Digital Industrial Revolution (DIR) (also known as 4-IR or Industry 4.0) will profoundly shape our efforts to promote industrial development. The scale, scope and complexity of this new technological revolution will bring experiences unknown to humankind in the form of Cyber-Physical Systems (CPS) where computers, networks and physical processes are integrated. In particular, when compared to the previous industrial revolutions, the DIR is occurring at an exponential pace.

In an already uncertain global economy the DIR is expected to have disruptive impacts on all economies, but especially on lower- to middle-income countries that find it difficult to keep abreast of the rapid speed of technological advancement and innovation.

For South Africa, the Digital Industrial Revolution poses substantial challenges and offers perhaps rather fewer immediately clear-cut opportunities for the domestic economy.

Opportunities

A strength of South Africa's position in the context of the DIR is its access to market opportunities across the African continent. Potential advantages include a broad youth base, a fast-growing growing continental middle class, access to global value chains as technology suppliers and the chance for SMEs to capitalise on new technologies.

Threats

Currently, we are not very well placed, ranking between 46th and 75th globally on a variety of metrics termed 'Readiness for the 4th Industrial Revolution'.

The key known components of the DIR - the Internet of things, big data, artificial intelligence, automation, robotics, new processes and materials, additive manufacturing, logistics, marketing techniques and sales channels - will put enormous pressure on areas where South Africa is currently lagging or weak:

- enabling infrastructure (broadband and communications);
- system of education and skills – more skilled jobs, less manual work;
- the traditional separation between primary and tertiary industrial sectors will not be sustainable as the distinctions between different sectors becomes increasingly blurred. (cf. the 'industrialisation of freshness').

Further potential threats include:

- selective 'reshoring' of industrial processes to major markets in advanced economies and other structural changes to global value chains;
- significant technology-driven employment losses in retail and services, mining and parts of manufacturing value chains (e.g. automotives), particularly for lower-skilled workers;
- growing inequality and exclusion;
- the danger of "winner-takes-all" outcomes, leading to greater concentration of production and higher barriers to entry. (While there may be potential for entrepreneurial/SME 'leapfrogging' up the value chain, new entrants will have to be well-positioned to begin with).

- The necessity of urgently developing a realistic, smart set of regulations attuned to the challenges that the digital revolution will bring to communications, e-commerce, environmental matters and so forth.

It is therefore Imperative to rethink the whole framework of public sector collaboration with the private sector. The traditional paradigm of low cost, export-oriented industrial policy is already under intense scrutiny; but, going forward, it will be critical to sort myths and projections from emerging tangible realities and, on this basis, to develop sector-specific strategies that take account of the full range of threats and opportunities presented by the DIR.

As a first step, in 2017 **the dti** established a new Chief Directorate, the Future Industrial Production & Technologies (FIP&T) unit, within the Industrial Development Division, to examine likely impacts and build capacity around government to confront the challenges of the DIR.

The FIP&T unit is contributing to international research through the World Economic Forum's *Shaping the Future of Production Systems*. This framework includes assessments of both country readiness and future skills requirements.

The Unit is also taking the lead in the industrialisation segment of the economic cluster through the newly established Digital Industrial Revolution National Coordination Committee.

Partnerships are commencing between **the dti** and the manufacturing sector through Industry Associations and Export Councils to prepare for the DIR. The augmented **dti** Intsimbi programme will be launched as a Future Production and Technologies initiative in 2018.

South Africa has also been appointed as Chair of the International Special Tooling & Machining Association (ISTMA) World Board (2018 to 2020), which aims to fully align the ISTMA World Association's work with DIR production systems and technologies. Taking advantage of the opportunity, South African Industry will establish an ISTMA Africa Forum to promote special tooling and machining in Africa.

In 2016 Cabinet approved the National Integrated ICT Policy White Paper which addresses the development of converged technologies, digitisation, how South Africans use the internet, communication and work.

The White Paper recommends that all South African citizens, irrespective of where they live or their socio-economic status, have a right to access and participation in the digital society. In addition, the department of Telecommunication and Postal Services (DTPS) has developed a National e-Government Strategy aimed at modernising and transforming future public service delivery.

Immediate ways forward

Here are some important steps that are already being taken and/or can be taken in the near future:

- Continue work with DST/CSIR Technology Localisation Unit (TLIU) and Product Life Cycle support initiative at CSIR (under the Siemens NIPP obligation.)
- Deepen research programmes with the WEF and OECD Development Centre on preparation for the Digital Industrial Revolution. This offers the necessary scope for deep-dive research into sector-specific country preparedness; our own in particular.
- Absorb and leverage learnings from the Manufacturing Indaba 2018 – particularly from the workshop on the Digital Industrial Revolution co-hosted by the World Manufacturing Forum, the DST and **the dti**.

Key Action Programmes

1. Establish a National Coordination Committee

Nature and purpose of the intervention

After a discussion held at the August 2017 Cabinet Lekgotla on the DIR, the Department of Telecommunication and Postal Services (DTPS) was appointed to take the lead in government consultations on DIR. To improve inter-governmental coordination, three government departments have been

selected to lead and develop an integrated strategy and policy in consultation with industry, labour and civil society: The DTPS, **the dti** and the DST).

Targeted outcomes

Establishment of a national coordinating committee for the development of an integrated DIR strategy and policy.

Key milestones

2018/19 Q1: Nomination and appointment of representatives from each of the three leading national departments.

2018/19 Q2: Report to the Economic Cluster.

Lead departments/agencies: DST, the dti, DTPS, EDD

Supporting departments/agencies: Other government departments in the Economic Cluster

2. Intsimbi Future Production Technology Initiative

Nature and purpose of the intervention

Statistics released by the International Specialised Tooling and Machining Association (ISTMA) at the World Tooling Conference in Toronto, Canada in 2013, indicated that up to 50% of all manufactured components' cost competitiveness is governed by tooling.

The industrialisation process in SA has been continuously hampered by a long-standing lack of tooling development support, resulting in many critical products being imported from the Far East.

In response to this predicament – and after extensive consultations with the industry - **the dti** and TASA launched the Intsimbi National Tooling Initiative as a turnaround strategy for South Africa's distressed tooling industry. Under the NTI, the NTIP acts as implementing agency and is responsible for the facilitation and management of all Intsimbi NTI programmes. The NTIP, a wholly-owned subsidiary of the Toolmaking Association of South

Africa (TASA), is also responsible for the engagement of competent project resources.

The aim of the Initiative is to enable government and industry to cooperate on the large-scale interventions required to rehabilitate the South African Tool, Die and Mould-making (TDM) sector and to embark on a robust rehabilitation programme to put the local industry on a firm trajectory towards international competitiveness. The partnership between the tooling industry (TASA) and **the dti** is governed by an overarching memorandum of agreement (MOA) and is supported by an annual service level agreement (SLA) between the two parties.

The main aim of the NTI is to raise the competitiveness of the TDM sector through critical skills development and job creation programmes, technology development and adoption, enterprise development and export promotion. Two major programmes have been identified, namely:

- The TDM Skills Development Programme; and
- The Enterprise Development Programme (EDP) focusing on SMME competitiveness improvement, localisation, clustering and export development activities.

Significant progress has been made under the Skills Development Programme since the inception of the partnership. In 2016, the Master Toolmaker qualification was registered; the South African Nuclear Energy Corporation SOC Ltd (NECSA) was accredited as the first national trade test centre; and capacity at delivery colleges was enhanced.

In this IPAP, we will build systematically on the foundations laid and the successes achieved thus far and seek integration into the education mainstream, working in partnership with DHET. Key immediate goals include the following:

- the accreditation of additional trade test centres for the new Toolmaker Trade Test (NQF level 5);

- trade testing all eligible students for the Toolmaker Trade Test;
- institutionalising applicable elements of the skills development programme at TVET colleges and other training institutions and embedding sustainable solutions for the programme as part of the current post-pilot phase;
- developing a suitable funding model to sustain the work in the current pilot programme; and
- exploring the expansion of the programme - its architecture and integrated solutions - to other advanced sectors of the economy.

Targeted outcomes

- improved technical capability of young talent to enter the manufacturing sector. This will, in the medium term: enhance skills and capabilities in South Africa's tooling industry; improve the sector's competitiveness; increase local content, promote investment in tooling manufacturing; increase employment.
- Introduction of two new trades into the new programme called Intsimbi Future Production Technologies Initiative - as identified by the industry.

Key milestones

- 2018/19 Q1: Launch of the new programme: Intsimbi Future Production Technologies Initiative.
- 2018/19 Q1-Q4: 120 eligible students to undergo trade testing on the new Toolmaker qualification.
- 2018/19 Q1-Q4: Benchmark 15 TDM sector companies.
- 2018/19 Q1-Q4: Implement intervention projects at 8 TDM sector companies.
- 2018/19 Q1-Q4: Operational learning and business process training at the pilot incubator for entrepreneurial enterprise development in support of localisation.

- 2018/19 Q4: Master Toolmakers Group 1 to complete their training programme.
- 2019/20 Q1-Q4: 150 eligible students to undergo trade testing on the new Toolmaker qualification.
- 2019/20 Q1-Q4: Further operational learning and business process training at the pilot incubator for entrepreneurial enterprise development.
- 2019/20 Q1-Q4: Benchmarking of 15 TDM sector companies.
- 2019/20 Q1-Q4: Intervention projects at a further 8 TDM sector companies.
- 2019/20 Q4: Master Toolmakers (Group 2) to complete its training programme.

Lead departments /agencies: **the dti**, Intsimbi partnership and NTIP

Supporting departments/agencies: NT, DST, DHET and NTIP, QCTO, merSETA, NAMB, Industry association and Export councils.





SECTORAL FOCUS AREAS 1



1. Automotives



Situational Analysis

The automotive industry remains an important pillar of South Africa's industrial landscape. The industry was set to produce 611,000 vehicles per annum as of mid-2017 and employs approximately 113,000 people across the seven light vehicle OEMs, M&HCV OEMs, and over 400 automotive component firms.

Further to this, it is estimated that employment is as high as 322,220 if the downstream activities of wholesale, retail trade and maintenance are included.

Notably, the industry has been able to successfully integrate itself into the global market and secure significant amounts of foreign direct investment as a result of the strong and consistent State support provided to it over the past two decades.

Key economic data

Economic Indicator	2015	2016
% Contribution to GDP	7.5%	7.4%
% Contribution to Manufacturing	33.5%	33.0%
Employment	82 100	82 000

Source: Quantec

OEM production volumes contracted by 2.2% in 2016 but are projected to increase by 7.0% during 2017. This projected growth is supported largely by export growth. It is positive to note that OEMs with light vehicle platform volumes in excess of 80,000 units per annum now include Toyota, Volkswagen, Mercedes-Benz and Ford. South Africa's most important platforms by volume are currently the Volkswagen Polo, Mercedes-Benz C-Class and Toyota Hilux/Fortuner.

While OEM and Tier 1 supplier output volumes reflect growth in recent years, progress in relation to increasing depth of localisation remains a challenge. This is evident from the fact that local content levels remain rangebound at around 40%, impacted upon largely by exchange rate movements rather than investment in new manufacturing capability.

Key opportunities

- Local and regional market development for vehicles and components;
- Localisation of targeted components at Tier 1 and Tier 2 level;
- Transformation of supply chain through development of Black suppliers;
- Competitiveness improvement of suppliers.

Constraints

- Relatively small domestic market;
- Mutual economic growth proposition with regional trading partners;
- General competitiveness gap between South Africa and other competing locations.

Key Action Programmes

1. The Automotive Master Plan

Nature and purpose of the intervention

The Automotive Master Plan, in development since 2016/7, represents the national strategy to further develop the automotive industry in South Africa through to 2035, in a manner consistent with the Presidential 9-Point Plan and the National Development Plan (NDP).

The six important priorities emerging from this process include local market optimisation, regional market development, localisation, infrastructure development, industry transformation, and technology and associated skills development. Importantly, the foundational requirements of a supporting institutional environment and an enabling post-2020 automotive incentive policy have also been identified.

During the transition period through to the new strategy and accompanying policy dispensation, focus will be placed on the priorities of localisation and Black supplier development with the aim of supporting industry growth and advancing transformation, particularly in the more labour-intensive supplier base.

Supporting activities will continue to be implemented in the key areas of improving supplier competitiveness through the Automotive Supply Chain Competitiveness Improvement (ASCCI), supplier upgrading projects, the Black Supplier Development (BSD) programme, and cooperative localisation projects able to support the needs of multiple customers.

Targeted outcomes

Establishment of a national coordinating committee for the development of an integrated DIR strategy and policy.

Key milestones

2018/19 Q2: Adoption of the Automotive Master Plan.

Lead departments/agencies: **the dti**, ASCCI

Supporting departments/agencies: Auto industry, organised labour

2. Empowerment: ASCCI Black Supplier Development (BSD) Programme

Nature and purpose of the intervention

The programme aims to develop 15 Black-owned manufacturing companies in the automotive and or related industries to a level where they become competent suppliers into the automotive value chain. The programme will be implemented in collaboration with vehicle assemblers. Each Black-owned supplier receives 18 months of best practice manufacturing support, general business support, mentoring and business development support. The programme is jointly funded by ASCCI (50%) and the participating private sector sponsors (50%).

Various OEMs and large Tier-1 suppliers have positively engaged in this programme and committed to co-sponsoring the Black-owned suppliers to receive mentoring and assistance in upgrading.

The programme will be monitored closely on both a project level and an industry level, with enhanced Black supplier competitiveness expected.

Targeted outcomes

Increased number of Black-owned suppliers in existing value chains within the automotive industry.

Key milestones

- 2018/9 Q1: Secure co-funding from private sector and selection of companies for development.
- 2018/9 Q2: Selection of companies, assessment and programme development.
- 2018/9 Q: Supplier assessment, programme development and delivery.
- 2018/9 Q4: Programme delivery.

A project close-out report can be expected by end September 2019.

Lead departments / agencies: **the dti**, ASCCI

Supporting departments/ agencies: Provincial Governments

3. Competitiveness Improvement Initiative: Large scale value chain upgrading (Phase 1)

The Large-Scale Value Chain Upgrading programme builds on the successful ASCCI World-Class Manufacturing (WCM) programme and seeks to follow a value chain approach which will deliver larger and more tightly focused projects with the core aims of improving supplier capability and deepening localisation within specific value chains. The programme will be delivered under the auspices of ASCCI.

Nature and purpose of the intervention

This intervention will extend competitiveness improvement and localisation support to automotive suppliers in a strategic value chain, with a particular focus on upgrading an entire value chain as well as improving strategic linkages that exist between the firms in that specific value chain. Much of the support is based on the methodologies tested and honed in the WCM programmes as well as learnings from localisation initiatives.

The successful upgrading of a strategically selected value chain will be measured by the adoption of best practices and technologies by the automotive suppliers, together with the adoption of a roadmap towards future localisation opportunities. Projects will be monitored at both a supplier project level and at an industry programme level.

Targeted outcomes

Enhanced competitiveness, localisation and ultimately employment creation.

Key milestones

2018/9 Q1:	Value chain selection and supplier enrolment complete.
2018/9 Q2:	Assessments report and projects identified.
2018/9 Q3:	Implementation progress report.
2018/9 Q4:	Final assessment report and case study.

Lead departments/agencies: **the dti**, ASCCI

Supporting departments/agencies: Provincial Governments; AIDC

4. Industrial Strategy for Mining and Construction Equipment (“Yellow Metals”)

Nature and purpose of the intervention

the dti has identified the lack of an industrial strategy for the yellow metals auto sub-sector as a major shortcoming that inhibits the development of sound Key Action Programmes for the IPAP.

Major existing bottlenecks are as follows:

- High costs of market entry;
- Low levels of transformation;
- Very low domestic manufacturing activities;
- Less than optimal tariff regime.

This situation requires an evidence-based policy position that will support the South African yellow metals industry to withstand competition and thrive in a difficult-to-forecast global and domestic market environment.

Targeted outcomes

A comprehensive set of interventions focused on market development, competitiveness improvement and the introduction of new capability. The implementation process will be co-ordinated by government in partnership with industry and organised labour and will be focused on: a) opportunity areas; b) new entrants at OEM level; c) preferential state procurement; e) regional market growth; and f) localisation of selected components and products.

Key milestones

018/19 Q2:	Submission for approval of yellow metals industrial strategy.
2018/19 Q3:	Execution of the recommendations proposed.
2018/19 Q4:	Monitoring and Evaluation of yellow metals industrial strategy execution.

Lead departments/agencies: **the dti**, EDD, PICC

Supporting departments/agencies: Auto industry, organised labour

2. Clothing, textiles, leather & footwear

Situational analysis

With adequate levels of investment, the Clothing, Textiles, Leather and Footwear (CTLF) sectors have the potential to create and sustain decent jobs and steady sectoral growth; hence government's continuing support for CTLF.

After extensive engagements with all stakeholders, **the dti** signed off on the Customised Sector Programme (CSP) for textiles and clothing in 2005 and for leather and footwear in 2008.

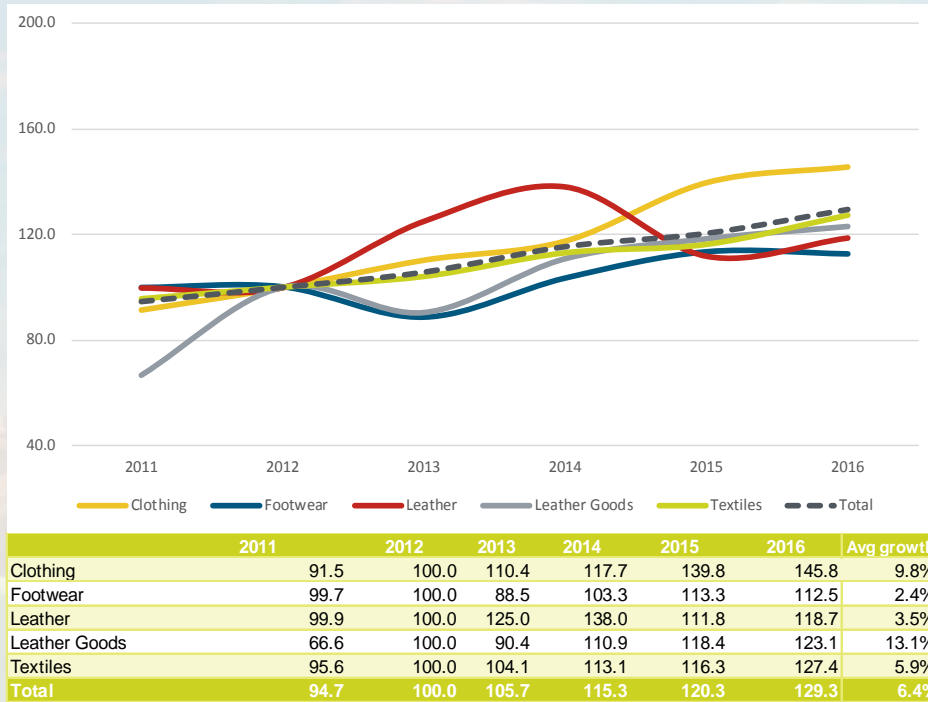
The implementation of the CSP strategies resulted in government introducing a market-neutral Clothing and Textiles Competitiveness Programme (CTCP) in 2009, replacing the former Duty Credit Certificate Scheme (DCCS).

The CTCP programme is subdivided into (i) the Production Incentive Programme (PIP) and (ii) the Competitiveness Improvement Programme (CIP).

As at 30th June 2017, PIP had approved a total of R5.1 billion, of which R4.2 billion had been disbursed to the industry.

As at 31st March 2019, the CIP - which is responsible for the establishment of collaborative retail cluster programmes - will have a total available amount of R1.11 billion. Meanwhile, as of 30th June 2017, R589 million had been disbursed to the different clusters participating in the programme. Analysis of growth in manufacturing value added (MVA) per Employee is derived from the CTCP Monitoring and Evaluation Database as at 1st December 2016 (see figure 1).

Figure 1: Change in MVA / Employee in CTLF from 2011 to 2016



Source: M&E the dti CTCP Desk at IDC (2011 – 2016)

On-time, in-full deliveries (OTIF) is one of the most important indicators of operational efficiency and customer service; and delivery reliability increased across all sectors for companies participating in the CTCP.

The CTCP has supported the development of scalable national cluster organisations and collaborative vertical and sub-national retail clusters. The Monitoring and Evaluation results to date indicate that the CTCP is effectively helping beneficiaries in upgrading capital equipment, processes, products and people as well as developing new markets.

In 2012, the CTLF sectors were designated at 100% local content under the revised Preferential Public Procurement Framework Act (PPPFA). To assist local manufacturers to build competitiveness and capacity through secured market access in public consumption, *Proudly South African* recently launched its tender monitoring system.

Over the past five years, South African footwear manufacturing has grown at an average rate of 10% annually, localising 21 million pairs of shoes/boots by import substitution. In July 2017, the National Bargaining Council of the Leather Industry (NBCLI) recorded a peak employment figure of 21,190 in the sector, clawing back jobs to a level last seen in 2007. Footwear manufacturing capacity enhancement continued increasing the number of factories operating, with annual output in excess of a million pairs - from 14 companies producing 50% of local output in 2015 to 22 companies producing 60% in 2016. Between 2010 and 2016, exports of leather and footwear grew by 167%, from R 1.98 billion to R 5.29 billion.

The main challenge currently being experienced is in the shortage of funding in the CTCP to allow more companies to participate and benefit. The other challenge is very low average real gross domestic fixed investment of R1.17 billion per annum across the other CTLF sectors – only 0.96% from 2010 to 2016; the exception being leather and footwear, which showed a real gross domestic fixed investment rate of 7.17%.

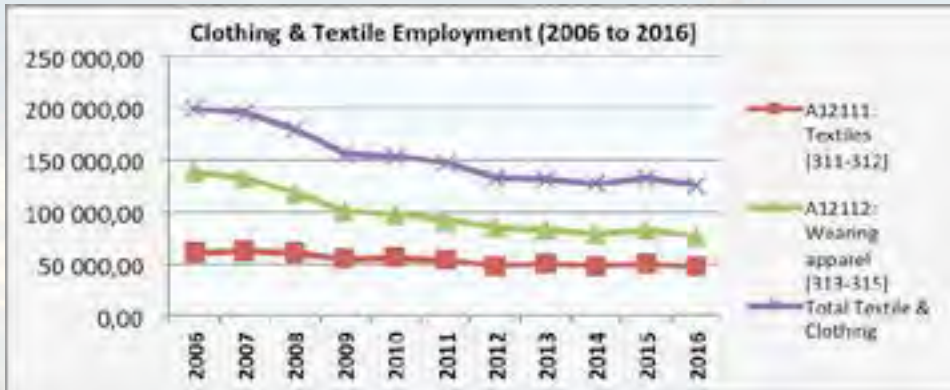
Sector economic data (2016)

Economic Indicator	2015	2016
% Contribution to GDP	0.4%	0.4%
% Contribution to Manufacturing	3.0%	3.1%
Employment	148,747	140,552

Source: Quantec database

The Textile & Clothing employment trend reveals that employment in the sector has been decreasing since 2006, but that job losses had begun to be stabilised by 2012.

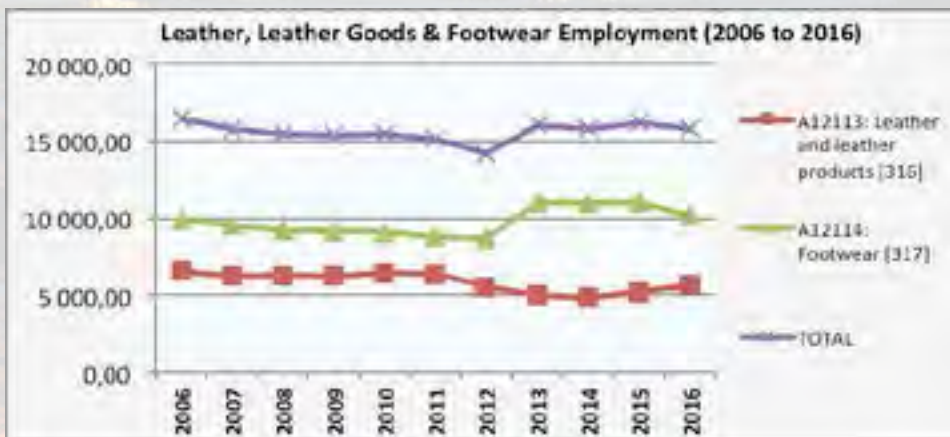
Figure 2: Formal & informal Employment in Textile & Clothing from 2006 to 2016



Source: Quantec database

Meanwhile, the leather and footwear employment trend reveals that employment in the sector decreased from 2006 to 2012; but that there has been a growth in jobs from 2013.

Figure 3: Formal & informal Employment in Leather & Footwear from 2006 to 2016



Source: Quantec database

Supported by both the CTCP and the 100% local content designation of the CTLF sectors, growth in real output rose by 4.7% from R 49.2 billion in 2006 to R 51.5 billion in 2016.

Figure 4: Growth in CTLF annual real output from 2006 to 2016



Source: Quantec database

CTLF real value added grew by 13.2% from 2006 to 2016.

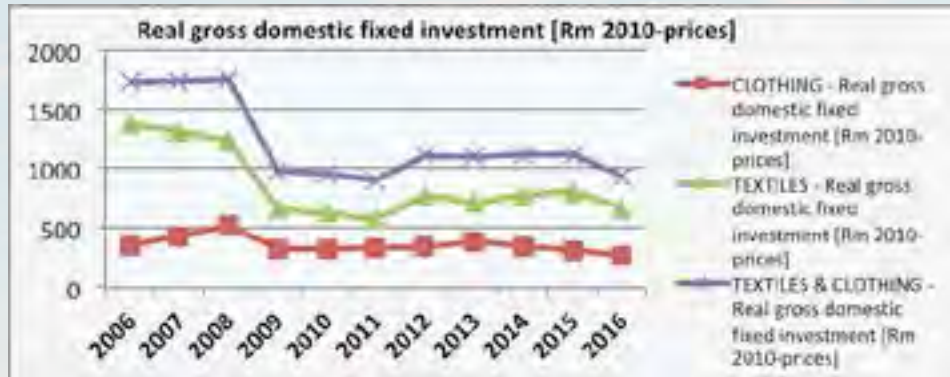
Figure 5: Growth in TCLF annual real value-added from 2006 to 2016



Source: Quantec database

Real gross domestic fixed capital investment in textiles and clothing declined sharply from 2008 to 2009, but stabilised from 2010, with a marginal annual growth rate of 0.29%.

Figure 6: Textiles & Clothing - Real gross domestic fixed investment



Source: Quantec database

Real gross domestic fixed capital investment in leather and footwear grew by 50% from 2010 to 2016, with a positive annual growth rate of 7.17%.

Figure 7: Leather, Leather Products & Footwear-real gross domestic fixed investment



Source: Quantec database

Key Action Programmes

1. Leather, Leather Goods & Footwear Testing Capacity Development

Nature and Purpose of the intervention

The Leather, Leather Goods and Footwear industry has been seriously affected by weak support from SABS and NRCS in the testing and certification of imports, new styles, export consignments and component testing. An industry working committee established by **the dti** in 2016 requested the Department to facilitate development of additional testing capacity dully accredited by local and international agencies.

The CSIR CTLF Competency Centre in Port Elizabeth has now undertaken to develop new Leather, Leather Goods & Footwear testing capacities, in collaboration with the Shoes and Allied Trade Research Association (SATRA-UK). This will begin with the CSIR developing a financial proposal.

Targeted outcomes

- Facilitation of trade services aimed at import substitution of footwear from 68 million pairs to 100 million pairs per annum;
- Footwear exports growth from 4.4 million pairs (R 0.432 billion) to 15 million pairs (R 1.3 billion) per annum;
- Exports of value-added Leather and Leather Goods from R 4.8 billion to R6.62 billion;
- Growth in domestic real output of Leather, Leather Goods and Footwear from R10.03 billion in 2016 to R 18.13 billion in 2020.

Key milestones

- | | |
|-------------|--|
| 2018/19 Q1: | Submission of financial proposal by CSIR to the dti . |
| 2018/19 Q3: | Approval of Leather, Leather Goods & Footwear Testing Capacity Development proposal and funding facilitation by the dti . |

Lead departments/agencies: **the dti**, CSIR

Supporting department/agencies: SABS, SATRA-UK

2. Development of Leather, Leather Goods & Footwear Export Cluster (Fashion Hub)

Nature and Purpose of the intervention

From 2010 to 2016 South African exports of value-added Leather, Leather Goods & Footwear grew by 167.2% - from R 1.98 billion to R 5.29 billion. Together with the South African Footwear Leather Export Council (SAFLEC), **the dti** conducted a review of past export performance and future prospects. The growth trends identified by the review confirmed that very strong export potential exists within both SADC and non-African regions.

However, to fully realise this potential, a number of critical sector-specific interventions were identified:

- International Competitive Intelligence (CI) development;
- Assessment of global colour, fashion and design trends;
- Development of collections and exportable product ranges;
- Collaboration with international agencies;
- Development of designated export-oriented capabilities;
- Development of the local fashion industry within the footwear, accessories and leather garments sub-sectors; and
- Intensive export marketing within SADC.

Unfortunately, due to lack of funding, SAFLEC could not complete a Trade Opportunity Matrix (TOM) based on the Gravity and Decision-Support Models (DSM) developed by North West University. This meant that no estimate has yet been made of Revealed Realistic Export Opportunities (RREO).

SAFLEC has requested **the dti** to facilitate establishment of Leather, Leather Goods & Footwear Export Cluster (Fashion Hub) in collaboration with eThekweni Municipality and the Fibre Processing & Manufacturing Sector Education and Training Authority (FP&M SETA). A full proposal will be developed by SAFLEC in collaboration with major export-oriented Leather, Leather Goods and Footwear manufacturers.

Targeted outcomes

- Increase in export revenue by 49% from R5.3 billion in 2016 to R 7.9 billion by 2020.
- Reduction in trade deficit by 22% from R 11.7 billion in 2016 to R 9.1 billion in 2020.

Key milestones

- 2018/19 Q2: Submission of a proposal by SAFLEC in collaboration with major export-oriented Leather, Leather Goods and Footwear manufacturers to **the dti**, eThekweni and FP&M SETA.
- 2018/19 Q4: Establishment of Leather, Leather Goods & Footwear Export Cluster (Fashion Hub).

Lead departments/agencies: **the dti**, SAFLEC, SAFLIA, eThekweni, FP&M SETA

Supporting department/agencies: EDD, TIKZN

3. Retail -Driven Integrated Supply Chain Programme (ISCP) - Phase 2

Nature and purpose of the intervention

To provide an implementation mechanism through which retailers will replace imports with products manufactured through fully integrated local value chains integration. The ISCP business model was successfully demonstrated through the Sustainable Cotton Cluster.

Targeted outcomes

Implement ISCPs with 84 local manufacturers and leading local clothing retailers.

Key milestones

- Q2: Five local clothing retailers participating in the cluster ISCP development programme.
- 2018/19 Q4: Five local retailers provided with volume commitments to local manufacturers.

2018/19 Lead departments/agencies: **the dti**, EDD

4. Cotton Sub-Sector Development Strategy

Nature and Purpose of the intervention

The National Cotton Sector Strategy was completed in 2016. It has profound potential for retail sector import replacement and for filling manufacturing capacity gaps and creating employment. Specific sub-sector strategies – for example cotton-spinning – will be developed to give additional structure to implementation activities. Sub-sector strategies for weft knitting, dyeing and finishing as well as retail have been developed.

Targeted outcomes

Sub-sector strategies to guide industry value chain development and capitalisation.

Key milestones

2018/19 Q1:	Strategies approved.
2018/19 Q2:	Development of sub-sector capitalisation programme.
2018/19 D4:	Implementation of sub-sector capitalisation programme.

Lead departments/agencies: **the dti**

Supporting departments/agencies: EDD, DAFF

5. Regional Cotton Textiles Development

Nature and Purpose of the intervention

The cotton strategy for South Africa was developed in 2016; and work will now be undertaken to formulate an extension to this strategy that will guide bilateral industry value chain capacity development initiatives with both SACU and SADC countries.

Targeted outcomes

A formal position on regional cotton textiles and clothing industries value chain development as a basis for bilateral trade and development with other regional countries.

Key milestones

2018/19 Q2:	Draft Strategy approved.
2018/19 Q4:	Consultation protocols for SACU and SADC finalised.

Lead departments/agencies: **the dti**

Supporting departments: EDD

6. Mohair value-addition to transform locally manufactured quality tops, yarn and finished products for both local and export markets

Nature and purpose of the intervention

Ongoing technological innovation and development in raw mohair fibre yield, fibre quality and fibre availability, based on sustainable practices and procedures, to establish South Africa as a significant contributor and preferred supplier to the global mohair value chain.

Targeted outcomes

A strong mohair sector strategy through engagement with the broader mohair industry to develop sustainable practices to improve fibre quality and value-addition.

Key milestones

2018/19 Q 2:	Completion of phases 1 and 2 of a sustainability system dynamic modelling project for the entire value chain, to increase commitment to farming Angora goats and manufacturing value-added products.
2018/19 Q4:	New markets developed for value-added products with special focus on exports.

Lead departments/agencies: **the dti**

Supporting departments/agencies: IDC, EDD

7. 2030 Master Plan for South African Retail, Clothing, Textiles, Leather and Footwear Value Chain

Nature and purpose of the intervention

The CTCP incentive focused on the global competitiveness of the textiles, clothing, leather and footwear manufacturing sectors; and these sectors have now stabilised and are showing signs of growth both in employment and capacity.

The 2030 Retail, Textiles, Clothing, Leather and Footwear Masterplan, focusing on retailers, will articulate a clear vision and associated set of objectives, programmatic interventions and policy support mechanisms for the development of the retail value chain through to 2030.

The intention is to focus on the development of a sustainable South Africa manufacturing value chain behind local retailers, thereby contributing to GDP and employment creation.

Targeted outcomes

Reduction in the textiles, clothing, leather and footwear trade deficit through import substitution. New employment creation and export-readiness through a streamlined quick- response manufacturing base.

Key milestones

- 2018/19 Q1: Completion of stakeholder engagement and the development of the draft 2030 Master Plan for the South Africa Retail and CTLF value chain.
- 2018/19 Q2: Endorsement of the Master Plan by all stakeholders.
- 2018/19 Q3: Implementation of the Master Plan.

Lead departments/agencies: **the dti**, EDD

Supporting departments/agencies: TIPS



3. Metal fabrication, capital and rail transport equipment

Situational analysis

The metal fabrication, capital and rail transport equipment cluster of sectors includes:

1. Ferrous Metals

The Ferrous Metals sector is classified into the upstream and downstream sectors. The upstream sector consists of the primary iron and steel (carbon and stainless) industry (flat-rolled products: coil; sheets, plate; long products: reinforcement bars; wire rod) and scrap metals. The downstream sector includes fabricated metal products (e.g. tubing and pipes; structural steel; extrusions; wire products; castings etc.)

2. Non-Ferrous Metals

The SA non-ferrous metals sector is mainly dominated by the aluminium and copper sub-sectors with the following products across the value chains:

- Primary: slabs, billets and ingots of aluminium, copper, brass, lead, nickel, tin and zinc;
- Midstream and downstream: flat and long products, extrusions, castings and foil;
- Precious metals fabrication and related downstream industries - e.g. jewellery manufacturing; diamond cutting and polishing.

High quality standards are maintained throughout each process in the manufacture of non-ferrous metal products, from validation of raw material to the final manufactured product.

3. Capital equipment

The Capital Equipment and Allied Services sector is defined as an intermediary sector that manufactures and supplies components such as: materials handling, environmental control, manufacturing processes, drilling, digging, earthmoving and complete plants. It is complemented by the capital equipment services industry which provides design, servicing and repairs; plus, the construction portion of the provision of solutions. The minimum lifespan of capital equipment is three years, excluding consumables.

Capital equipment is largely used in manufacturing, mining and the development of infrastructure.

4. Rail Transport Equipment

The South African rail industry has been in existence for over 100 years and is one of SA's major manufacturing sectors. The Rail Transport Equipment (RTE) sector consists of the following sub-sectors:

- Rail infrastructure sub-sector: permanent way, civil engineering, power supply, signalling, engineering and consulting services.
- Rail rolling stock sub-sector: manufacturing and assembly of locomotives, wagons, electric multiple units and coaches for the movement of passengers and freight. The rail recapitalisation programme - and the leveraging of this programme to deepen local industrial capabilities - remains a major government priority. Going forward, this will require very significant improvement in the implementation of rail designations. (Rail signalling at 65%; rolling stock at varying local content thresholds: e.g. diesel locomotives at 55%; electric locomotives at 60%; wagons at 80%; and electric multiple units at 65%).

Sector Economic Data

Economic Indicator	2015	2016
% Contribution to GDP	18.8%	18.0%
% Contribution to Manufacturing	33.5%	33.0%
Employment	325,251	311,404

Source: Quantec

Figure 1. Real value-added – 2011-2016

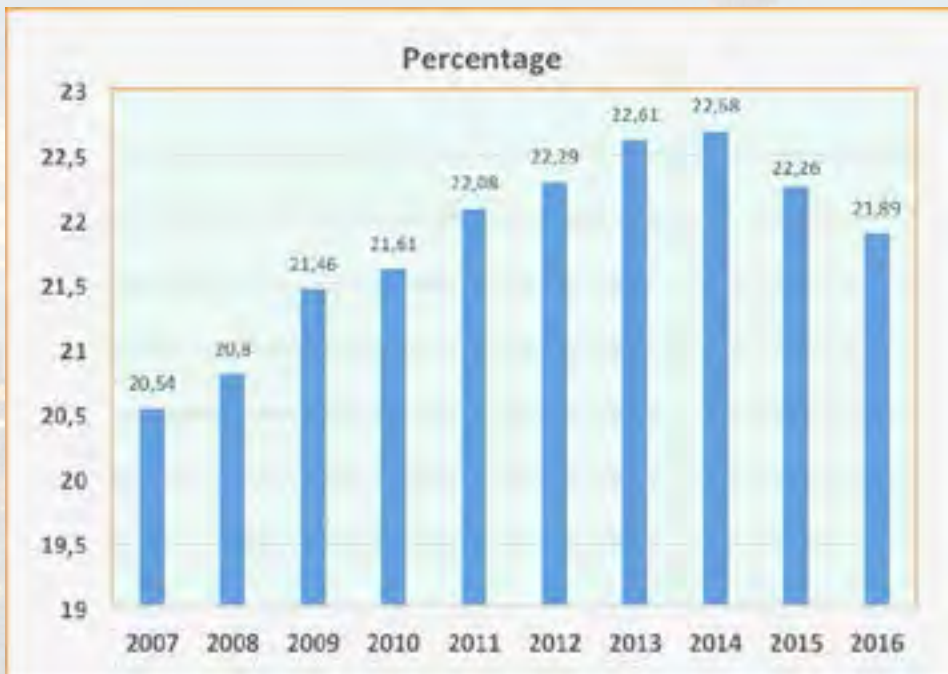


Source: Quantec

The contribution to manufacturing employment by the downstream metals sector declined somewhat during 2016, contributing 21.89% to manufacturing employment.



Figure 2. Contribution to manufacturing employment by the downstream metals sector: 2007-2106



Source: Quantec

Figure 3. Contribution to trade deficit: 2013-2017



Source: Quantec

The trade deficit for the downstream metals sector improved in 2016. However, the sector has lost some competitive advantage in export markets. This is particularly prominent in the steel sector, with the global industry confronted by overcapacity challenges.

The main contributors to the trade deficit are mainly electrical systems, such as transformers; static converters and switch gears associated with the Eskom build programme.

While there is a clear government programme to reduce import leakage in the rail manufacturing industry, imports of components and systems remain prevalent as the rail recapitalisation programme is being implemented. Similarly, although taps, valves and actuators are designated for local production, imports of these products remain prevalent.

Key constraints

1. While Government has prioritised localisation, the following impediments continue to persist:
 - Long procurement process; state owned companies taking too long to adjudicate and award tenders.
 - Inconsistent interpretations of environmental legislation by municipalities, impacting on foundries' sustainability.
2. Uncompetitive input costs (electricity, logistics and raw materials):
 - Escalating electricity prices are rendering firms, especially high energy consumers, uncompetitive. This, in addition to stringent environmental compliance requirements, further burdens the already depressed foundry industry.
 - Despite the price preference system implemented by ITAC, access to quality scrap and pricing remains a serious challenge for foundries, and for steel mini-mills in particular.
 - Inefficiencies and high costs of road, rail and port infrastructure continue to undermine the competitiveness of the downstream industry. (Particularly to be noted here is the slow pace of the branch-line rehabilitation programme).
3. Inefficiencies across the entire value chain:
 - Inadequate capital investment due to three decades of low demand has led to plant, machinery and equipment not being continuously upgraded or replaced.
 - Variable and often out-of-date production and technological capabilities have

resulted in the industry losing ground in maintaining local content and being unable to best capture new opportunities offered by both private and public capital expenditure programmes.

- Continued decline in capacity utilisation due to subdued global and domestic demand is further exacerbating inefficiencies in the value chain.
4. Unequal trading platforms:
 - Higher tariffs and non-tariff barriers in potential export markets (increasing advanced economy implementation of restrictive trade remedies to protect domestic manufacturers).
 - Downward tariff pressures on a number of value-added products resulting in a surge of imports, particularly in low-value, high-volume manufactured goods.
 - The global steel surplus continues to put downward pressure on steel prices and demand across the entire value chain, hence threatening the survival of the downstream industry.

Key opportunities

Key areas of opportunity for growing the sector and/or achieving higher impact include:

- The SA infrastructure-build programme (including the Strategic Integrated Projects). This presents the largest single opportunity to stimulate the industry on the back of localisation requirements and focused supplier-development programmes.
- Significant investments in rail network and infrastructure projects on the African continent will increase the demand for locomotives and wagons. In addition, the African Union's designation of SA as a rail Centre of Excellence for the African continent provides a crucial platform to deepen SA rail manufacturing capabilities.
- Opportunities exist to integrate rail rolling stock suppliers into global OEM value chains.
- The maintenance programme for the newly procured EMU and locomotives will also provide opportunities once the warranty has expired.
- Moves towards greening the economy present an opportunity to implement energy-saving measures in the energy-intensive industries and achieve better compliance with environmental requirements.

Key Action Programmes

1. Designation and Localisation

Nature and purpose of the intervention

Government seeks to achieve a general target of 75% local content across public procurement. This remains an important pillar for the revitalisation of the metal fabrication, capital goods and rail sectors, but can only be achieved by leveraging current and future government capital and operational expenditure programmes which might facilitate the standardisation and designation of fleets within the programmes.

This KAP will refine, reinforce, complement and test the efficacy of the localisation and designation programmes. For instance, engagements with procuring entities and manufacturers on the implementation of the current designations have revealed a strong need for alignment and consolidation to provide clarity and simplification during procurement.

Targeted outcomes

- Better leveraging of the localisation opportunities presented by state infrastructure programmes;
- Reduction of import leakages;
- Increased investments in key manufacturing processes and activities for supply into domestic market;
- Better capture of after-market opportunities;
- Support for the revitalisation of lost manufacturing capacity;
- Increased employment and exports.

Key milestones

2018/19 Q3: Revise the power pylon and sub-station structures and include additional components; further unbundling of currently designated components to provide greater clarity to SOCs. Further amendments to the instruction note will entail the inclusion of railway electrical infrastructure components.

2018/19 Q1-Q4: Create industry collaborative forums with General Electric and Electro-Motive Diesel to deepen localisation in the maintenance of existing diesel locomotives.

2019/20 Q2: Review the rail rolling stock instruction note for streamlining and maximisation of local content thresholds.

Lead department: **the dti**

Supporting departments/agencies: NT, EDD, DST, IDC and SOCs

2. National Foundry Technology Network

Nature of the intervention

The National Foundry Technology Network (NFTN) is an initiative of **the dti** and the industry aimed at revitalising the foundry industry through skills development and enterprise development. The programme seeks to reverse the erosion of the foundry industry, which has over the years negatively impacted on the competitiveness of the broader manufacturing sector. Key issues that emerged in 2016 which require coordinated efforts across the relevant spheres of government and the industry include the following:

- inadequate order book to improve production efficiencies and cost competitiveness;
- high product development and tooling costs impeding the industry's penetration into key sectors (e.g. rail and automotives);
- inconsistent interpretations of environmental legislation by municipalities; and
- lack of adequate electricity infrastructure and inflated energy pricing.

Targeted outcomes

The development of a globally competitive SA foundry industry through appropriate skills training, technology transfer and diffusion of state of the art technologies.

Key milestones

- 2018/19 Q1-Q4: Five foundries assisted under the Competitiveness Improvement Initiative programme (CII). The CII programme will prioritise product development, energy saving measures, environmental and waste management needs and deepen the localisation of castings in key sectors.
- 2018/19 Q1-Q4: Facilitate dialogue and targeted programmes between the DEA and the foundry industry to avert further foundry closures.
- 2018/19 Q1-Q4: Provide technical support to foundries to obtain accreditation that will enable them to access global OEM supply chains.

Lead department: **the dti**

Supporting departments/agencies: NT, CSIR, NFTN, DST, TLIU

3. Dedicated support programme for the Jewellery Industry



3.1. Market access and export promotion

Nature and purpose of the intervention

With the assistance of **the dti**, the jewellery sector has managed to increase exports over the past 5 years by more than 290%. In 2016, exports exceeded R1 billion. In order

to achieve further growth in exports, the Chinese market has been identified as holding growth potential for the South African manufactured jewellery sector.

Targeted outcomes

Increase market access for the jewellery sector in the Chinese market.

Key milestones

- 2018/19 Q1-Q4: Facilitate participation by South African jewellery manufacturers at a suitable Chinese exhibition (or exhibitions).

Lead departments: **the dti**

Supporting departments/agencies: SBD and SEDA

4. Gold Loan Scheme guidelines amendments

Nature and purpose of the intervention

To expand the current Gold Loan Scheme to enable jewellery manufacturers and diamond cutters and polishers to finance not only gold, but also other precious metals, diamonds and gemstones.

Targeted outcomes

Improved access to the Gold Loan Scheme and the jewellery-manufacturing sector's overall cost competitiveness, ensuring that key raw materials required in the manufacturing of jewellery are included.

Key milestones

- 2018/19 Q1-Q4: Amend the Gold Loan Scheme to include other jewellery manufacturing raw materials; revise the qualifying criteria.
- 2019/20 Q1-Q4: Roll out the Gold Loan Scheme

Lead departments: **the dti**, EDD

Supporting departments/agencies: IDC

4. Agro-processing

Situational/ analysis

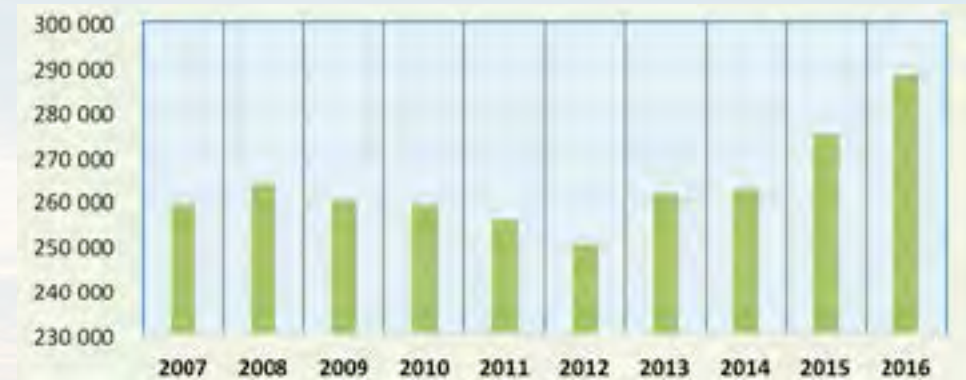
Government has firmly identified agro-processing - together with its upstream sector - as a critical driver of inclusive growth in South African economy, with very significant job creation potential. (At least a million possible new job opportunities). The commitment to agro-processing has been repeatedly articulated: in the National Development Plan (NDP); successive iterations of IPAP; the Agricultural Policy Action Plan (APAP); Operation Phakisa for Agriculture, Land Reform and Rural Development (2016); and the Presidential 9- Point Plan (Revitalisation of the Agriculture and Agro-processing Value Chains).

The South African agro-processing sector has particularly strong linkages both up- and downstream. Upstream, the sector links to agriculture across a wide variety of farming models and products.

Downstream, the sector's products are marketed across wholesale and retail chains and through a diverse array of restaurants, pubs and fast food franchises. Agro-processing is the largest single sub-sector in manufacturing, showing relatively rapid growth in sales and employment over the past 15 years.

As depicted in figure 1 below, in 2007 the total manufacturing sector had 258,000 employees. This increased to 288,000 in 2016; but the potential for continuing robust employment growth was severely inhibited by the post-2008 global economic downturn, local labour unrest and the recent severe - and in many areas, continuing - drought.

Figure 1: SA Agro-processing employment



Source: Quantec Easy data, 2017

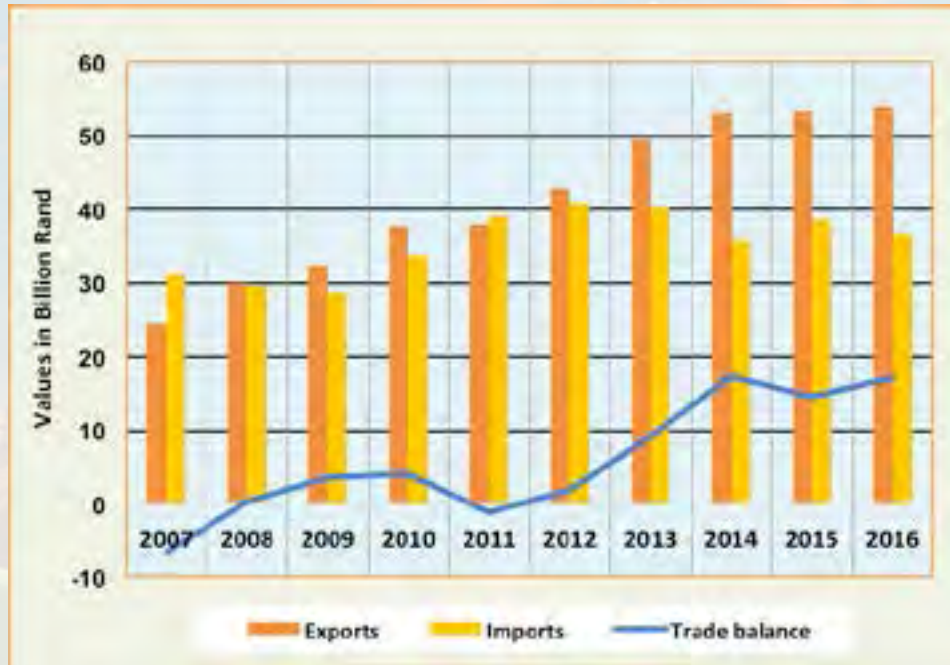
Sector economic data

Variables	Contribution in 2016
Agro-processing GDP (% of GDP in manufacturing)	R80.9bn (21%)*
Agro-processing employment (% of Manufacturing)	288 567 (21%)
Trade balance	R17 bn

Sources: Statistics SA and Quantec Easy Data, 2017

As shown in Figure 2 below, SA is a net exporter of agro-processed products. At the same time, South African domestic food demand has increased substantially over the past decade and this trend is expected to continue. The increase has been driven by population growth, changing consumption patterns - mainly of middle-income groups - and gradually improving overall living standards.

Figure 2: SA Agro-processing Trade balance



Source: Quantec Easy Data, 2017

But the advance of agro-processing has been hampered by lack of sufficient investment in processing facilities, particularly in the rural areas.

These are some of the reasons that have contributed to inconsistency in the agro-processing trade balance. The main contributors towards a positive trade balance are fresh fruits (citrus, grapes, apples, maize and other processed products such as wine, fruit juice, nuts and refined sugar). On the other hand, the main contributors to SA imports are rice, poultry, wheat, alcohol spirits, palm oil and soy oil cake.

Digging a little deeper, the main imports can be categorised as falling under the heading of staple foods: wheat, cooking oil, sugar and poultry (in most years); and maize (during drought years).

Local production of soya has increased rapidly, but wheat has been increasingly displaced by imports. Local poultry producers have found it difficult to compete with very low-cost imports mostly from Latin America and Europe. Two core constraints on competitive local poultry production are its reliance on largely imported feed (mostly yellow maize and soya products), and the fact that local feed is sold at import-parity prices.

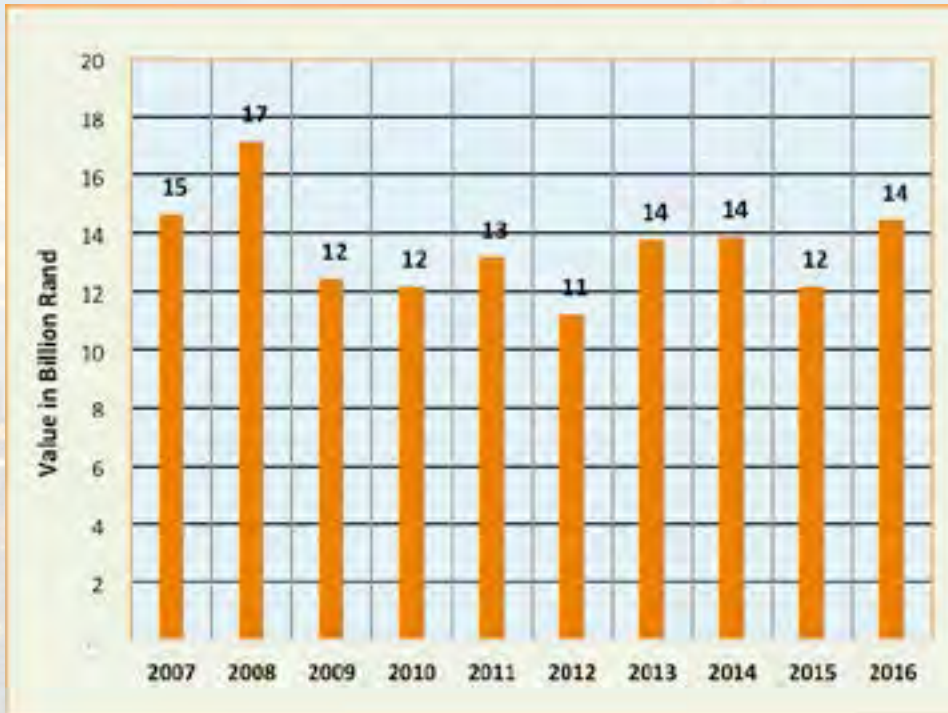
- Luxuries: alcohol, chocolates, coffee, tobacco and niche foods are imported on a fairly large scale, mostly for the upper-income group. They are to some extent re-exported to the region.
- Industrial products: soya, juice and wood and paper products are generally further processed in South Africa.

INVESTMENT NEEDS OF THE SECTOR

Agro-processing has made a reasonably significant contribution to GDP over the past 10 years, with total investment currently standing at R14.5 billion (2016). There is, however, a strong need for the sector to invest in new machinery and technology, product development and safety and quality certification. This goes hand-in-hand with the need to develop strategic alliances and partnerships that will assist local producers to penetrate new markets.



Figure 3: SA Agro-processing Real Gross Domestic Fixed Investment



Source: Quantec Easy Data, 2017

It is widely recognised that investment in innovation and technology is under-provided by the market, due to the risks involved and the long-time horizons for return on investment. South Africa does have pockets of technology capabilities that can be leveraged to narrow the gap with technologically sophisticated developed and developing countries.

The approach to innovation and development that needs to be followed in agro-processing must be the creation of an environment that gives a revived dynamic to the sector by opening opportunities for emerging new entrants and SMMEs to enter the formal market, supplying value-added niche processed products. This implies developing a customised structure for the agro-processing sector to access government resources for R&D – with a particular focus on product development and small-scale processing technology.

CONSTRAINTS AND OPPORTUNITIES IN THE AGROPROCESSING SECTOR

The IPAP is premised on the principle of critical engagement with industry to identify opportunities and constraints and continuous improvement of sector-specific interventions required to unlock industry growth. The following constitute the main cross-cutting constraints and opportunities in the agro-processing value chain:

Constraints

1. High levels of concentration across the value chain, which limit employment creation and maintain unnecessarily high prices. Concentration is exemplified on the one hand by the dominance of a few large trading, manufacturing and retail chains, and, on the other hand, by the limited growth of small producers and the self-employed across the value chain. Dealing with this situation requires both continued strong punitive interventions by the Competition Commission and positive economic interventions to promote small-scale production.
2. Because rural municipalities are often under-resourced, producers there frequently encounter poor quality water and electricity supply as well as delays in permits and repairs.
3. Input constraints emerge from the relatively high price of some key inputs, notably maize and soya. This arises in part from the way commercial farmers are organised around strong support institutions. As a result, they are able to lobby for tariffs against competitive imports and tend to promote pricing in line with international markets rather than domestic costs. In addition, South Africa has only limited land and water availability for expanding crop diversification. In these circumstances, trade within the region could help, but only if freight transport could be made more cost-effective. In addition, efforts to expand low-water production methods could help for some crops.

Opportunities

Agro-processing has the potential to make a significant difference to both the country's foreign trade and aggregate employment. But with food systems becoming increasingly detached from agriculture - and more industrial in nature – it is easy to see why they are dominated by large firms that benefit from economies of scale. One of the implications is

that it is increasingly difficult to distinguish between processed and unprocessed primary products in terms of technological sophistication, scale, cold chain management and advanced logistics.

Improved competitiveness can be attained through skills development and innovation, improved productivity, industrial infrastructure development, improved access to raw material and recapitalisation of design skills. There is also potential for cluster development. Benefits that can be drawn from developing such clusters include economies of scale, shared infrastructure, shared and reduced input costs, information-sharing and market access interventions aimed at both local and regional markets.

Key Action Programmes

1. Development of National and Regional Niche Sectors

Nature and purpose of the intervention

South Africa has a huge diversity of underused indigenous plants that represent an enormous wealth of agro-biodiversity and have the potential to contribute to improved incomes, job creation and local economic development. The Bio-economy Agriculture Sector Implementation Plan identified new or underdeveloped crops that have the potential to be developed into new and special commercial products.

This programme is two-fold: firstly, it takes a long-term view of research and development with an eye to producing new cultivars and varieties of niche indigenous plants; secondly, it focuses on aggressive commercialisation of the niche products identified in last year's IPAP iteration.

Targeted outcomes

Identification of existing, isolated pockets of niche sector players and development of a sustainable value chain cluster framework to realise integrated industrial development.

The specific objectives are as follows:

- To enhance the competitiveness of niche sectors to realise export potential - primarily driven through R&D;
- To increase the contribution of niche sectors to manufacturing GDP;
- To unlock the potential of the upstream and downstream niche sector value chain, to enhance the creation of sustainable decent employment;
- To increase the participation of small and medium scale agro-industrial enterprises in the value chain, particularly in the least developed rural areas.

Key milestones

- | | |
|-------------|--|
| 2018/19 Q1: | Facilitate the establishment of the cluster management structure for one potential niche sector. |
| 2018/19 Q2: | Facilitate the packaging of a business proposal for the cluster management structure of one niche sector. |
| 2018/19 Q3: | Facilitate access to resources for the cluster management of one niche sector through a dti incentive. |
| 2018/19 Q4: | Commence the implementation of cluster management for one niche sector. |
| 2019/20 Q1: | Facilitate the establishment of a cluster management structure for two potential niche sectors. |
| 2019/20 Q2: | Facilitate the packaging of a business proposal for the cluster management structure of two niche sectors. |
| 2019/20 Q3: | Facilitate access to resources for the cluster management of two niche sectors through dti Incentives. |
| 2019/20 Q4: | Commence the implementation of cluster management for two niche sectors. |
| 2020/21 Q1: | Identify a preferable regional destination for at least one agro-processing niche industry. |

- 2020/21 Q2: Review of domestic and regional market opportunities and regulatory frameworks.
- 2020/21 Q3-4: Facilitate market access to promote domestic trade and export opportunities for the niche sectors.

Lead department: **the dti**

Supporting departments/agencies: DST, EDD, DAFF, DEA, Provinces, CSIR, ARC, IDC & TIA

2. Attract strategic investments to unlock the potential of underutilised agro-processing facilities

Nature and purpose of the intervention

To identify the potential of underutilised agro-processing facilities and turn them around as viable, sustainable, job-creating agribusinesses. This can be done through strategic investments and facilitation of market access through a supplier development programme.

Targeted outcomes

Unlocking the potential of underutilised agro-processing facilities as anchor projects in the downstream value chain, creating sustainable decent employment.

Key milestones

- 2018/19 Q1: Commence consultation process with relevant stakeholders on auditing of the underutilised potential agro-processing facility to be supported and draw up a programme of action.
- 2018/19 Q2: Data collection to conduct audit for underutilised agro-processing infrastructure.
- 2018/19 Q3: Draft report on audited agro-processing infrastructure.
- 2018/19 Q4: Final Report on audited agro-processing infrastructure.
- 2019/20 Q1: Identify at least two underutilised potential agro-processing facilities which could be revived and supported in partnership with key stakeholders and strategic investors.
- 2019/20 Q2-3: Develop a turnaround strategy to operationalise these facilities.

- 2019/20 Q4: Facilitate market off-take agreements through the supplier development programme.
- 2020/21 Q1: In collaboration with TISA and ISA, facilitate regional and global markets through pavilions and trade shows.
- 2020/21 Q2-3: Attract investments for at least three additional under-utilised agro-processing facilities.
- 2020/21 Q4: Facilitate market access for three further underutilised agro-processing facilities through supplier development programmes, pavilions and trade shows.

Lead departments: **the dti**

Supporting departments/agencies: DAFF, EDD, DRDLR, Provinces, Provincial Investment agencies and DFIs.

3. Facilitate the development and competitiveness of the Halal industry

Nature and purpose of the intervention

This programme is aimed at enhancing the domestic and global competitiveness of the South African Halal industry. The global Halal industry is estimated to be worth around US\$ 2.3 trillion (excluding Islamic finance). Growing at an estimated annual rate of 20%, the industry is valued at about US\$ 560 billion a year, which makes it one of the fastest growing consumer segments in the world.

The global Halal market of 1.8 billion Muslims is no longer confined to food and food-related products. The Halal industry has now expanded beyond the food sector to include pharmaceuticals, cosmetics, health products, toiletries and medical devices as well as service sector components such as logistics, marketing, print and electronic media, packaging, branding, and financing.

South African Halal manufacturing companies are in a perfect position to also benefit from this growing global Halal market. The industry in South Africa has been identified by a number of organisations as having the potential to contribute towards very significant growth and job creation.

However, not enough is known about the SA Halal market, either in terms of its end-user profile or in terms of product quantity and quality. It is essential that the Halal industry value chain be properly understood to support the development of its manufacturing opportunities. This will enable South Africa to put in place the necessary support structures to ensure the sustainable development of the industry from producer to consumer.

Targeted outcomes

Creation of an extensive set of Halal value chains; investment, trade and job creation. (For example, the hand-slaughter requirement makes an obvious contribution to the labour-intensity of production).

Key milestones

- 2018/19 Q1: Round-table on development of sector strategy for the Halal industry in collaboration with the Western Cape (WC).
- 2018/19 Q2: Draft sector strategy for the Halal industry in WC.
- 2018/19 Q3: **Final strategy for the Halal industry in WC.**
- 2018/19 Q4: Commence implementation of the sector strategy for Halal Industry in WC.
- 2019/20 Q1: Roundtable on development of sector strategy for the Halal industry in collaboration with KZN.
- 2019/20 Q2: Draft sector strategy for Halal industry in KZN.
- 2019/20 Q3: Final strategy for the Halal industry in KZN.
- 2019/20 Q4: Commence implementation of the sector strategy for Halal Industry in KZN.
- 2020/21 Q1-Q4: Develop a National Strategy for the Halal industry.

Lead departments: **the dti**, Western Cape and KZN provinces

Supporting departments/agencies: DAFF, EDD, DRDLR, Provincial Investment Agencies and DFIs

4. Poultry Value Chain Programme to unlock critical constraints

Nature & Purpose of Intervention

To work with stakeholders and investors to unlock constraints in the poultry value chain that currently inhibit new investments, deeper localisation and inclusive growth. This programme will pilot the establishment of Mechanically Deboned Meat (MDM) poultry processing to reduce imports. (SA Imports of MDM increased by 10% per annum between 2012 (131,317 tons) and 2016 (195,256 tons)).

Targeted outcomes

- Taking forward the value chain alignment work undertaken in the Poultry Task Team, Poultry Value Chain Round-table and Operation Phakisa;
- Increased competitiveness of the poultry industry; support for new entrants (small to medium scale poultry producers); localisation of manufacturing;
- Reduction of the poultry trade deficit;
- A stable model for setting up successful MDM facilities countywide.

Key milestones

2018/19: Q1-Q2: Finalisation of Business Plan/Case for Mechanically Deboned Meat (MDM poultry) facility.

2018/19 Q3 – Q4: Commencement of implementation of the MDM pilot plant.

Lead departments/agencies: **the dti**

Supporting departments/agencies: IDC, EDD, DAFF, DRDLR, provincial economic and agricultural departments

5. Agro-Processing Export Development

5.1. Rooibos export development

Nature & Purpose of Intervention

Rooibos is a uniquely South African plant with a global market footprint. It is generally traded as a flavoured infusion, thus neutralising the benefits of the original plant. Extensive local and international research has indicated the vast benefits of Rooibos both for medicinal and cosmetic use. The South African government successfully applied for Rooibos to be recognised as a uniquely South African product and therefore qualify for

Geographic Indication. To maximise global recognition of Rooibos' Geographical Indication (GI), extensive publication of its properties and promotion in targeted markets need to be undertaken.

Targeted outcomes

Increased brand recognition and global demand for rooibos tea and value-added products for food, medicinal and cosmetic use, creating higher revenues along the value chain.

Key milestones

2018/19 Q1-Q4: Implementation of the Rooibos Sector Strategy: validation and publication of Rooibos properties in international journals (food and medical), including new clinical trials.

2018/19 Q1-Q4: Positioning of Rooibos in targeted export markets (promotions, exhibitions etc.)

5.2. Fruit export development

Nature and purpose of the intervention

South Africa is ranked amongst the world's largest producers of fresh fruit and nuts (citrus, macadamia, pears, avocados etc.). The sub-sector is the largest contributor in terms of value to agricultural exports, equating to 90% of total agricultural exports. The implementation of Operation Phakisa and Fruit Value Chain Round-table outcomes is targeted at rapidly accelerating export growth and developing value-added/processed products in both new and existing markets.

Targeted outcomes

Expanded exports; development of new value-added/processed products in targeted export markets.

Key milestones

2018/19 Q1-Q4: Establishment of a market intelligence centre to improve current research and market information deficiencies in sub-sectors specifically targeted for exports.

2018/19 Q2-Q4: Acceleration of negotiations and conclusion of trade protocols for specific fruits and value added/processed products in prioritised export markets in Asia, Middle East, Europe and Africa.

Lead department: **the dti**

Supporting departments/agencies: DAFF, IDC

5.3. Sugar industry development

Nature and purpose of the intervention

The South African sugar industry makes an important contribution to the national economy, given its agricultural and industrial investments, foreign exchange earnings, labour-intensity (especially in rural areas) and direct linkages with other downstream industries.

It is characterised by heavy concentration – a few large-scale commercial farmers supplying over 80% of production, whilst the great majority of small-scale farmers (\pm 20,000) contribute approximately 10% of production.

Similarly, representation at the milling level is skewed towards a few historically advantaged large players. It is critical for the long-term sustainability of the industry to recognise the role and significance of small-scale growers in the value chain and to develop the necessary measures to achieve inclusive growth in the industry.

Targeted outcomes

- Broadly: accelerated sector growth, mainly through improved standards and expanded participation of previously disadvantaged individuals (PDIs) in the sugar value chain.
- Specifically: create conditions to enable existing small producers to increase their scale of production, broaden possibilities for new entrants; open access to resources and markets through genuine partnerships that promote skills transfer, management mentorship and co-sharing of infrastructure.

Key milestones

2018/19 Q1-Q3: Development of Sugar Industry Transformation Plan.

2018/19 Q4: Commence implementation of Sugar Industry Transformation Plan.

Lead departments/agencies: **the dti**, EDD, DAFF

Supporting departments/agencies: South African Sugar Industry



5. Forestry, timber, pulp, paper and furniture

Situational Analysis

The forestry, timber, pulp, paper and furniture sector not only has the potential to create more jobs and growth in marginalised areas of South Africa; it is also emerging as a sustainable future sector incorporating bio-refinery and transformative technologies.

The forest-based industries are no longer limited to traditional wood-processing, furniture, pulp and paper. Through nano-technology and other scientific advances, they have now progressed to providing raw material for the clothing and textiles, pharmaceuticals, rheology and food-processing sector.

The sector contributed R71.2 billion to GDP in 2015, up from R69.5bn in 2010. (See Table 1). This amounts to an 18.7 % contribution to manufacturing GDP and 2.3 % to national GDP. Forestry manufacturing contributes R30.1 billion, making up 7.8 % of total manufacturing GDP).

Table 1: Forestry Timber Pulp, Paper and Furniture Contribution to GDP

Industry	2010	2011	2012	2013	2014	2015
Forestry	10 838	10 965	10 943	11 076	11 420	11 102
Wood and paper; publishing and printing	31 097	31 646	32 183	32 403	32 683	32 425
Furniture; other manufacturing	27 642	27 585	28 533	28 493	28 557	27 721
Total	69 576	70 196	71 659	71 972	72 660	71 248

Source: Statistics South Africa (at 2010 prices: R'000,000)

Despite its potential, the sector faces major structural challenges around access to raw materials, finance and markets, especially for new applicants. These have held back development. The regional integration initiative being developed by government is aimed at improving access to both raw materials and markets.

The Africa South of Sahara region is endowed with high quality indigenous forests which, if used properly, could lead to substantial growth in the region's forestry value chain. It is important to note that most of the logs used for manufacturing go to pulp and paper, due to shorter rotations. (See Figure 1 below).

Figure 1: Log usage in manufacturing 2105/16



Source: Sawmilling South Africa

Wood Processing Sector

Situational analysis

The wood processing sector is comprised of board manufacturers and manufacturers of wood-based products. This sector contributes about R14 billion to manufacturing GDP.

There have been notable investments in advanced wood-processing technologies, particularly in the board manufacturing industries. The sawmilling industry is labour-intensive and a key contributor to the rural economy.

The current level of industry processing recovery (rate per log at 49%) needs to be increased to at least 55%. In practice, this means that the sawmilling industry needs much

more investment in research and technology - both to improve the recovery rate and to produce more advanced products - e.g. engineered products like cross-laminated timber.

Figure 2 shows output from sawmills in the period July 2007 to June 2017 - which predominantly goes to the construction sector. This is an area where increasing attention should be given to improved product diversity.

Figure 2: Lumber Sales 2007 to 2017



Source: Sawmilling South Africa

Furniture Manufacturing

Situational analysis

The South African furniture Industry is an important sector in the South African economy, considering both its labour-intensiveness and its potential for the development of SMMEs and improved export capability.

Currently the industry employs approximately 26,400 people, spread over 2,200 registered manufacturing firms. It contributes about 1% to manufacturing GDP and 1.1% to manufacturing employment.

The industry's level of competitiveness has, however, declined over the years. This has been attributed to a skills shortage, declining investment in capital equipment and insufficient research and development.

Although local manufacturers have lost some market share to imports, South Africa's exports of furniture were worth US\$ 4.23 billion in 2016, with seven out of the top ten South African export destination markets being other African countries, namely: Namibia, Botswana, Swaziland, Lesotho, Zambia, Mozambique and Zimbabwe. The top growing export product from 2009 to 2016 was mattresses with springs (60.4%).

Pulp and Paper Manufacturing

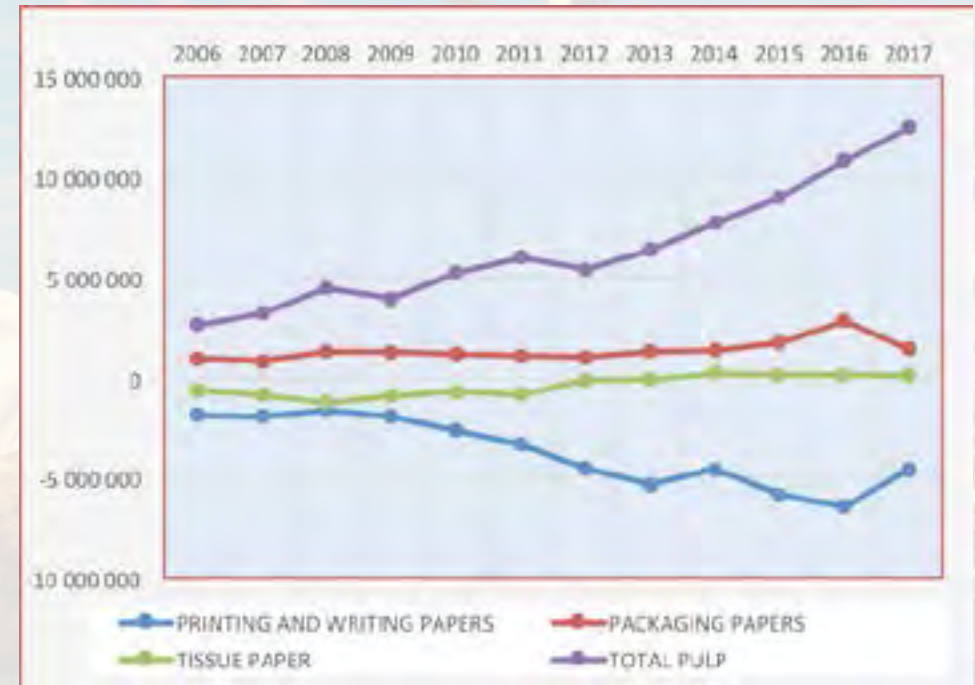
Situational analysis

The pulp and paper sector has shown some resilience to global economic pressures and has remained on a positive growth trajectory, with its net positive trade balance rising from R5.26 billion in 2010 to R10.7 billion in 2016.

There has, however, been a sharp increase in the importation of printing and writing paper grades, where the deficit has grown from negative R2.6 billion in 2010 to negative R6.4 billion in 2016.

The major contributor to the positive trade balance has been dissolved wood pulp, which contributes more than 60% of total exports in the sector. While this is positive for the economy, there may be additional opportunities for further beneficiation of this product locally, which could create additional downstream sub-sectors and reduce South Africa's dependence on importation of such products. Examples of these products are found in the clothing and textile, bio-based packaging, medical, food and household products sectors.

Figure 3: Pulp and Paper Industry Balance of Trade: 2006 to 2017 (R' '000,000)



Source: PAMSA

Constraints

The key constraints across all the value chains include:

- Raw material - security of supply;
- Structural market access where there is high market concentration in some subsectors for example, furniture and building construction markets.
- Inadequate access to funding and markets and declining competitiveness;
- Lack of investment in critical infrastructure and Insufficient promotion of timber in the built environment;
- In the furniture and wood processing sectors: shortage of skills, ageing machinery, lack of research and development, little design improvement or new product development; poor enforcement of regulatory instruments.

Opportunities

Key opportunities across value chains are:

- **Bio-refinery and transformative technologies**

Continuous upgrading in the bio-refinery and transformative technologies space is the key to reducing costs and providing continuous product improvements across all value chains. In the forestry sector, transformative technologies promote novel and strategic uses for wood fibre and its many products and derivatives.

- **Africa as a strategic market and market diversity**

Africa has vast resources of unique indigenous wood that require a concerted effort at regional level to integrate resources and enhance processing capacity to enable value creation. In the furniture sub-sector, for instance, market development can be linked to regional and international niche market development, with considerable export potential.

- **Competitiveness enhancement for specific value chains**

This entails improving access to funding, improved recovery efficiencies, recapitalisation, skills development, industrial financing and public procurement. Streamlined access to DFI funding will lead to industry expansion and the creation of jobs in marginalised industries.

Table 2 gives a summary of the opportunities for the major value chains.

Table 2: Opportunities in the Pulp and Paper, Wood Processing and Furniture Manufacturing Industries

1. PULP AND PAPER	
Improve raw material	<ul style="list-style-type: none"> • Re-afforestation and new afforestation. • Increasing the recovery of recyclable paper to meet local and global demand. • Regional integration.

1. PULP AND PAPER	
Skills development	<ul style="list-style-type: none"> • Increased enrolment of chemical engineers and technicians. • Artisan training and apprenticeship.
Infrastructure development	<ul style="list-style-type: none"> • Investment in rail network closer to the plantations.
New local market development	<ul style="list-style-type: none"> • Development of sustainable and renewable energy. • New technologies. • Opportunities offered by co-generation in the pulp and paper industry. • New product development for nano cellulose applications.
Expansion into African and Asian markets	<ul style="list-style-type: none"> • Growth in demand for packaging and tissue paper products in African and Asian markets, driven by population growth, urbanisation and rising living standards.

2. WOOD PROCESSING SECTOR	
Competitiveness Enhancement	<ul style="list-style-type: none"> • Infrastructure upgrade: road, rail and industrial. • Productivity enhancement to improve recovery rates. • Recapitalisation - new equipment. • Innovation and technology.
Improved access to raw material	<ul style="list-style-type: none"> • Space to improve recovery rate through recapitalisation and efficient use of resources. • Regional integration for sustainable supply of raw materials.

2. WOOD PROCESSING SECTOR

New Market Development	<ul style="list-style-type: none"> • New product development – packaging. • Producing cranes and board manufacturing for furniture industry. • Green building – use of renewable resource. • Export promotion – outbound trade missions.
Skills Development	<ul style="list-style-type: none"> • Technical skills development programmes. • Business management skills development for small sawmillers. • Cluster and hub development opportunities.

3. FURNITURE MANUFACTURING

Improved Competitiveness	<ul style="list-style-type: none"> • Improve productivity through recapitalisation and innovation. • Skills development: enhance design skills, tooling and apprenticeship programmes. • Industrial infrastructure development: furniture manufacturing hubs. • Raw material supply: backward integration with sawmillers. • Recapitalisation and design skills.
Market Development	<ul style="list-style-type: none"> • Intra-sector Cluster Development. • Low income market development of durable products; mass production for this market. • High income market development: unique high-quality niche markets. • Export markets: grow regional markets and maintain existing global markets presence. • School and office furniture market.

3. FURNITURE MANUFACTURING

Improve Access to Funding	<ul style="list-style-type: none"> • Capacitate small companies to enable them to access funding; private sector to assist with this. • Cluster development.
Regulatory	<ul style="list-style-type: none"> • Enforce designations mandated under the Public Procurement Preferential Framework Act. • Through the Consumer Protection Act, promote awareness of high quality products.

Key Action Programmes

1. Furniture Market Access Programme

Nature and purpose of the intervention

Market access intervention is aimed at both local and regional markets. The influx of imports, especially from the East, has shrunk the domestic market share of furniture manufacturers, especially at the low end of the market, where small and medium companies operate. Two major challenges facing manufacturers are the high concentration of the furniture retail sector and getting retailers to buy locally produced furniture.

The large retailers, collectively, have 80% of the local market. The rest is shared among independent furniture retailers. This affords the retail sector huge bargaining power with manufacturers, leading to suppressed producer prices and a lack of appetite for new prospective entrants.

The key aims of this intervention are:

- Improving access to markets for locally manufactured products – especially with an eye towards regional export markets; in particular, SADC.
- Improving local market share in the low-income furniture market, which is currently dominated by cheap imports.
- Cluster development in the furniture sector through co-location of companies in the

same geographical areas. Furniture incubators will be targeted for the development of product-specific and market-orientated development, to enhance mass production.

Targeted outcomes

Increased local market share and increased exports to regional markets.

Key milestones

- 2018/19 Q2: Develop Regional Market and Product Destination Matrix.
 2018/19 Q3: Review of domestic and regional market opportunities and regulatory frameworks.
 2018/19 Q4: Development of market access programme to facilitate trade promotion and export promotion activities.

Lead departments/agencies: **the dti**, SAFI

Supporting Departments/agencies: DST, DBSD, SEFA, CSIR, Export Councils, CSIR, Fibre Processing and Manufacturing SETA

Milestone 2: Enforcement of Local Furniture Procurement

Targeted outcomes

Increased local market share and increased exports to regional markets.

Key milestones

- 2018/19 Q1: Development of public furniture procurement guidelines.
 2018/19 Q2-Q4: Implementation of the furniture guidelines.

Lead departments/agencies: **the dti**, National Treasury

Supporting departments/agencies: SAFI, Department of Public Enterprises, Public Procurement Body; IDC, Fibre Processing and Manufacturing SETA. SALGA

2. Regional Development Programme in the Forestry Value Chain

Business cases for investments in the region

Nature and Purpose of intervention

The Forestry Beneficiation Framework points out the need to strengthen the supply of raw material to the industry and the need to improve access to raw material. The regional

development programme and the development of the strategy will address the two major constraints that the industry is facing. For the past few years, **the dti** has assisted South African companies to explore opportunities for investments and import of timber from Mozambique.

Through TISA's offices across the African continent, **the dti** promotes South African investment and export promotion in a number of jurisdictions, as well as strategic timber imports which contribute towards addressing the raw materials shortage in South Africa for advanced manufacturing.

Targeted outcomes

Two business cases will be developed during the 2018/19 financial year.

Key milestones

- 2018/19 Q1 – Q2: Analysis of regional forestry sector opportunities.
 2018/19 Q3 – Q4: Development of two high-impact regional business cases.

Lead departments/agencies: **the dti**

Supporting departments/agencies: DAFF, PAMSA, SSA, FSA, SAFI, SAFCOL, DPE

3. Paper Recycling Programme for South Africa

Nature and Purpose of intervention

the dti recognises the important role that recycling plays in the local economy. It also acknowledges that there is a need to invest in the recycling industry to increase the recycling of paper to meet local and global demand. A Paper Recycling Programme for South Africa has been proposed which will be supported and partly managed by **the dti**.

The programme's core focus will be to increase paper available to collectors through enterprise development, paper recycling awareness campaigns and strategic partnerships.

the dti already supports enterprise development through the provision of financial and non-financial assistance. It is envisaged that these existing avenues for enterprise development will be leveraged to meet some of the objectives of the Paper Recycling Programme.

The programme will be piloted in the Ekurhuleni municipality, but expanded to other municipalities when the pilot has proven to be a success. It is expected that local demand for recycled fibre will be met as a result of increased paper recycling rates.

Targeted outcomes

Improved paper recycling rates and formalised recycling enterprises in the Ekurhuleni Municipality and beyond.

Key milestones

- 2018/19: Q2: Implementation of Paper Recycling Programme in Ekurhuleni Municipality.
- 2018/19: Q4: Implementation of a further Paper Recycling Programme in Gauteng.
- 2019/20: Q4: Roll-out of Paper Recycling Programmes to other major metros.
- 2020/21: Q4: Implementation of Paper Recycling Programme to smaller municipalities.

Lead departments/agencies: PAMSA, **the dti**

Supporting departments/agencies: PRASA, Ekurhuleni Municipality, Tshwane Municipality, Joburg City, Ethekewini, SALGA, DEA, FP & M Seta

6. Plastics, pharmaceuticals, chemicals & cosmetics



6.1. Plastics sector

Situational analysis

The plastics sector is an important component of economic development, producing goods, applications and services used across the entire economy, including infrastructure programmes, construction, general engineering, mining, automotives, packaging etc.

The industry's contribution to the economy is therefore significant; and also expressive of increasingly innovative connections with the green economy.

In 2016, the plastics sector contributed about R76 billion to the total economy, representing about 1.9% of GDP and approximately 16.5% of manufacturing sector output. The plastics industry employs around 60,000 people (both formal and informal), with almost 1,800 companies across the plastics supply chain.

Sector economic data

Economic Indicator	2015	2016
% Contribution to GDP	1.6%	1,9%
% Contribution to Manufacturing	14,3%	16.5%
Employment	60,000	60,000

Source: Quantec

The South African plastics manufacturing sub-sector is part of a supply chain stretching from the polymer manufacturing industry (chemical companies) through to a variety of end-use markets. It is characterised by relative ease of entry because of its low economies of scale and high degree of mechanisation. This means that there are many micro- and small companies and a few medium-sized plants, while plastics manufacturing facilities can be found within a number of other manufacturing industries.

Plastics manufacturing and conversion is also a very diverse sub-sector and can be further broken down into several sub-industries related to raw materials and the manufacturing process. Some plastic products are in themselves a final product, but the clear majority are inputs into other industries where they form components for the manufacture and assembly of other products.

The South African plastics industry is largely characterised as a commodity plastics sector in that it is generally a lower margin, volume-driven industry. The largest consumer of plastic production is the packaging market, which creates relatively good opportunities for value-addition in other high-value sectors of the South African economy.

Facts and figures 1:



Source: Plastics SA, 2017

Recycled input material in 2016 was 329, 099 tonnes – an increase of 5.9% when compared to 2015.

Facts and figures 2:

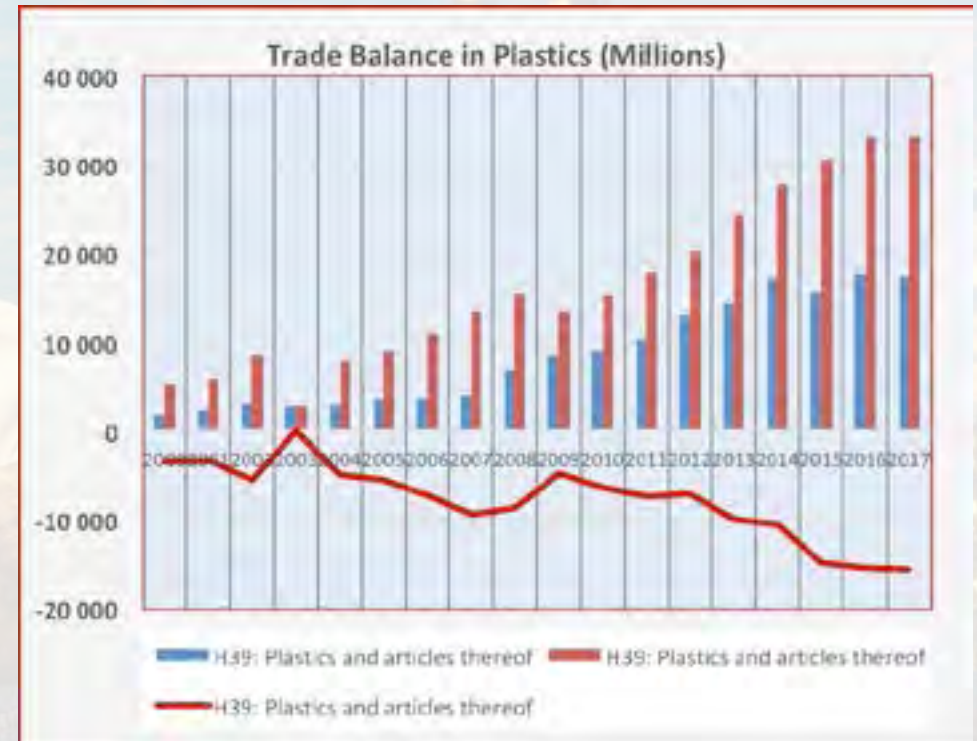


Source: Plastics SA, 2017

Trade balance

The export value of plastic products in 2016 was R17.6 billion compared to an import value of R33.1 billion, signifying a trade deficit of R15.6 billion – the highest negative Rand value thus far for the sector.

Figure 1. Imports, exports and Rand trade balance: 2000-2017



Source: the dti 2017

Key constraints

- Access to key raw materials;
- Pricing of raw materials;
- Relatively small local and regional market;
- Lack of advanced manufacturing practices;
- Lack of downstream focus on R&D effort;
- South Africa's geographic position and resultant logistics costs.

Key Action Programmes

1. Development of polymers from waste

Nature and purpose of the intervention

Local demand for polyethylene polymers continues to grow at a rate of 4% to 5% annually. Globally, there is a deficit in the supply of ethylene and as a result, access to available and competitively priced polyethylene polymers is increasingly becoming a problem. Due to the growing global and local demand and a progressive shift to increasingly use polyethylene polymers, it is a necessity to expand both ethylene and related polymer production locally, using innovative technologies to give downstream converters a competitive advantage. One such specialised technology is the conversion of waste gas to ethanol, which can be converted to ethylene and further processed to polymers.

This new technology will enable waste gas such as carbon monoxide to supplement South Africa's current chemicals and plastics polymers mix. Successfully achieving this at a commercial level will add value to waste gas resources while also significantly reducing our dependency on fossil resources, reducing CO₂ emissions and possibly reducing operational costs.

This technology breakthrough also has the potential to use municipal solid waste to produce ethanol and other chemicals such as butadiene, isopropanol and isoprene. It represents a significant step towards a truly circular economy and a zero-waste society.

Targeted outcomes

Increased local production and availability of polymers and other important chemicals. Decreased reliance on imported polymers and stabilisation of price fluctuations; hence, increased competitiveness of the downstream plastics conversion industry, job creation and reduced carbon footprint.

Key milestones

2018/19 Q1 – Q4: Development of a feasibility study to determine the economic viability of using the technology in South Africa. Pilot scale demonstration of the technology to determine the commercial viability of the technology and process locally.

Lead departments/agencies: **the dti**, DEA, IDC, DST, industry

Supporting departments/agencies: EDD

2. Plastics Industry Skills Development, Testing and Innovation Cluster

Nature and purpose of the intervention

This cluster intervention will focus on improving innovation and competitiveness in the plastics industry through skills development, R&D and testing. The cluster will be predominantly based on shared infrastructure and equipment.

The primary focus of the skills development component will be targeted on the following three areas of improvement:

- Critical skills for sustainable growth, development and equity - improving the quality and relevance of training provision;
- Promoting employability and sustainable livelihoods;
- Assisting unemployed learners to participate in accredited work, integrated learning and work place experience programmes to acquire critical skills to enter the labour market and/or self-employment.

The testing component will build a laboratory that will be used to do sample testing, trial runs for companies, product development, analysis of products and materials, assistance with the development of waste material products and testing for export opportunities, where products need to meet certain international standards.

The long-term goal is to have the laboratory certified by international bodies, which will allow South African products to be tested locally for export opportunities. There are currently only a few very small laboratories in South Africa for plastics, which represents a huge problem for the industry.

The intervention will be supported by partnerships that can be created with other entities like the CSIR and higher education institutions.

Targeted outcomes

- Unblock impediments to competitiveness and growth;
- Assist in creating a pool of skilled professionals;
- Give the industry better direction to enable it to develop its people to world-class standards;
- Increase employment;
- Increase and spread innovation;
- Develop new products and markets;
- Upgrade product quality;
- Increase the productivity of companies involved in clusters;
- Increase export volumes.

Key milestones

- 2018/19 Q1-Q2: Development of cluster proposal. Identify cluster members and facilitate registration of the Non-Profit Company.
- 2018/19 Q3: Assist in developing the cluster business plan and develop a funding mechanism.
- 2018/19 Q4: Implementation of the cluster's business plan

Lead departments/agencies: **the dti**, Plastics SA, provincial economic departments

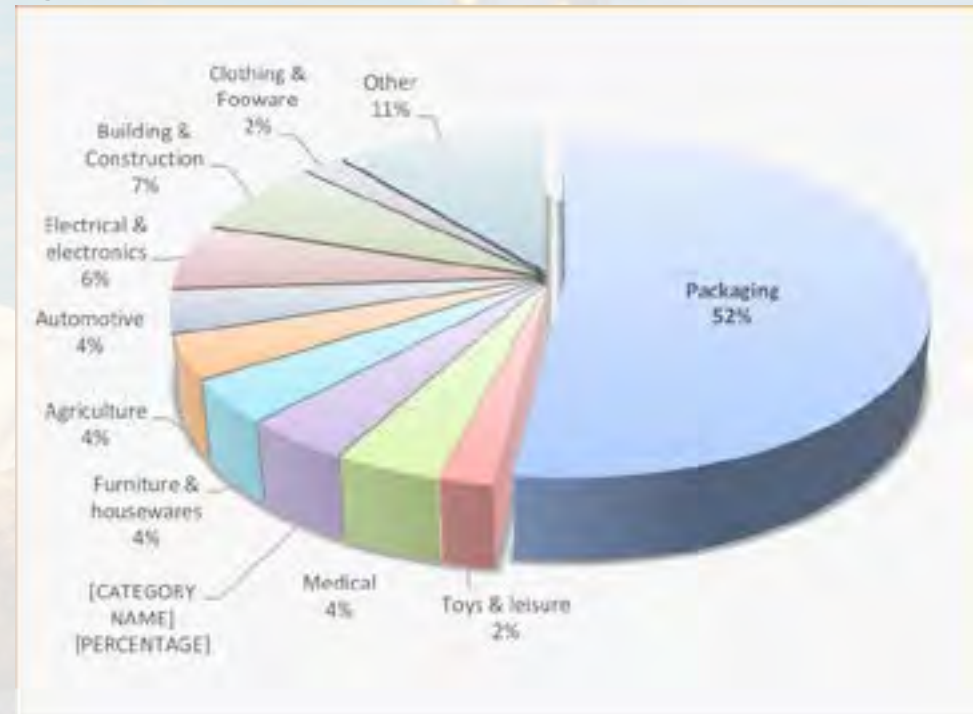
Support departments/agencies: CSIR, academic institutions

3. Promotion of the integration of plastic components into the automotive sector

Nature and purpose of the intervention

The automotive sector has high growth potential for the plastics industry as the increased usage of plastics is a new trend used to increase fuel efficiency by lowering the weight of the vehicle. However, locally this sector has not seen growth over the last couple of years. In fact, polymer conversion for the plastics automotive market sector has decreased from about 7% in 2012 to about 4.2% in 2015 – see Figure 2 below.

Figure 2: South African Plastic Market Sectors, 2016



Source: **the dti** 2017

This sub-sector of plastics will therefore be prioritised and there will be a drive to promote the localisation of plastic components in the automotives sector. This will have a positive growth impact on the plastics sector as these projects will be based on high value products rather than commodity-based products (like packaging), thus leading to import replacement and opportunities to increase the local plastics manufacturing base.

Targeted outcomes

- Increased local manufacturing of plastic components for the automotive sector;
- Reduction of the growing trade deficit in plastics through import replacement and increased exports;
- Development of a targeted black plastics component manufacturer in the automotive value chain.

Key milestones

2018/2019 Q1-Q2:	Identification of OEMs and Large Tier-1 implementing partners to assist with the development of a focused supplier development programme for plastic components.
2018/2019 Q3 and ongoing:	Development and implementation of the supplier development programme including targeted mentorship interventions/incubation, product off-take and resourced process/shop-floor development.

Lead departments/agencies: **the dti**, OEMs, NAACAM, ASCCI

Supporting departments/agencies: EDD, IDC, DST

6.2. Pharmaceuticals and medical devices



6.2.1. Pharmaceuticals sector

Situational Analysis

The South African pharmaceutical market is forecast to grow at a CAGR of 6.6% ($\pm 1.5\%$) over the period 2016-2021, reaching R54.1 billion by 2021. Pharmaceutical companies will also increasingly benefit from the 2016 roll out of a centralised procurement database.

According to IMS Health, demand for medicines will continue to rise, but pressure on prices will intensify. Coupled with a further gradual rise in levels of generic use, this will limit overall rates of increase in market value.

Despite efforts to increase the country's pharmaceutical manufacturing base, pharmaceutical companies operating in the country will continue to see their operations impacted by inadequate infrastructure, rising electricity costs, increasing security costs and a shortage of talent.

Industry sources have suggested that some large pharmaceutical companies are considering consolidating offices across Sub-Saharan Africa, reflecting the growing importance of other countries in the region. These sources believe the move could potentially result in the closure of some company offices in South Africa, with regional headquarters likely to move to the East African region.

Pharmaceuticals facts and figures:

- Heavy import reliance.
- Active Pharmaceutical Ingredients (APIs) = R22 bn imports.
- Trade balance around R20 bn.
- Contribution to manufacturing GDP is about 0.48%.
- Direct employment around 9,600.
- CAGR estimated at 6.6%.

Bio-pharmaceuticals facts and figures:

- Public market – R4.6 bn.
- Private market - R7 bn.
- Veterinary medicines.
- Heavy import reliance.
- CAGR estimated at 4.5%.

6.2.2. Medical Devices sector

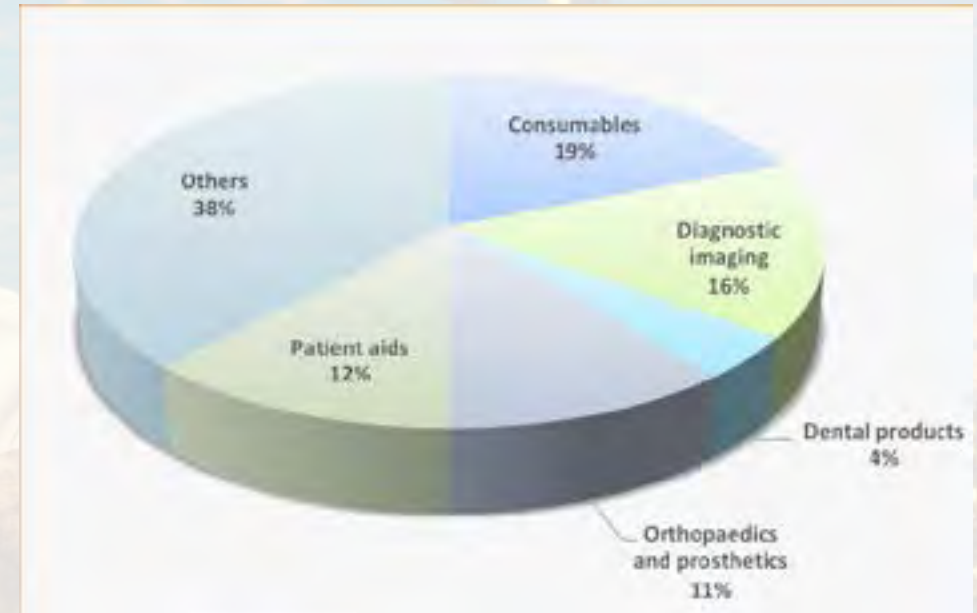


Situational analysis

In 2013 the South African medical devices market (consumption, production and trade) was estimated at US\$1.2 billion, and was forecast to grow at a compound annual growth rate (CAGR) of 12%. This puts the current 2017 value at close to US\$1.6 billion or R20 billion. The reasons underlying such growth include population growth, increased life expectancy, growing quadruple disease burden and increased domestic healthcare spend due to the gradual introduction of the NHI.

South Africa's spend on medical devices per capita is US\$24, which is comparable to fellow BRICS countries. However, when compared with more mature markets such as the United States and Germany, where per capita spends stand at US\$399 and US\$313 respectively, there is certainly abundant room for growth. Local players are likely to take a growing share of the South African market as they move into more high-tech areas, claiming much of the extra value from the predicted market growth.

Figure 3. Medical devices market breakdown 2016



Source: Quantec

Medical Devices facts and figures (devices, diagnostics; consumables and equipment):

- Heavy import reliance: estimated total value of medical device imports is R14 billion;
- Total market value is estimated to be R20 billion;
- Local production of medical devices is about R3 billion;
- There are about 165 local manufacturers;
- Local manufacturing employment is about 5,000 people;
- CAGR is estimated at 12%.

Challenges faced by the sector

Domestic firms face challenges on multiple levels, including:

- Regulatory delays of up to 5 years or more.
- Lack of access to a range of accessible and well-priced input materials such as polymers, metals and textiles that countries like India and China have.
- Large volumes of API and excipients continue to be imported and are subject to exchange rate fluctuations.
- Increase of cheap imports in the medical devices space, disadvantaging local manufacturing.
- Misdeclaration and customs fraud.
- Relatively small local and regional markets.
- Lack of downstream focus on R&D.
- Poor and costly logistical service levels.
- Utility supply shortages and costs.
- Skills shortages.
- Outdated technologies and processes resulting in the manufacture of products that are uncompetitive; hence, lower local demand and increased imports.

Key Action Programmes

1. Trade Measures to protect the local pharmaceutical manufacturing industry

Nature and purpose of the intervention

South Africa is largely dependent on imports from international markets for most of its pharmaceutical products, especially APIs, which are mostly provided by the MNCs based in the country.

The main destination for South African pharmaceutical exports is the SADC region. The country has an advantage compared to other African countries as it is the only country that meets WHO standards to manufacture pharmaceutical products. It is this advantage that makes the country more appealing to the MNCs.

However, depending so much on imports poses a risk to South Africa. The imported products are priced in foreign currencies and when the Rand is depreciated the products cost more. It appears that the country has the potential to produce more pharmaceutical products as its exports are expanding gradually. However, with no tariff rate, the dominant players will outplay small, newly established firms. The unintended outcomes that may come as a result of imposing a tariff should also not be overlooked.

Notably, all the imported pharmaceutical products are tariff-free. The bound tariff rate, however, ranges between 10% and 30% for pharmaceutical products, with 15% on medicaments, which are the country's biggest import.

Specific capabilities have been developed in the manufacture of certain molecules such as ARVs, with six local companies having established competencies to formulate, tablet and package ARVs locally. Given that this currently government's biggest health commodity spend, it is imperative that a significant portion of the state's procurement be given to local players. **the dti** will support industry mechanisms where necessary to promote local manufacture against cheaper imports.

Targeted outcomes

Optimised localisation opportunities presented by state procurement and state infrastructure programmes; reduced import leakage; increased investments in key manufacturing processes and activities for supply into the domestic market; capture of significant after-market opportunities; contribution to the revival of lost manufacturing capacity; increased employment and exports, increased market access at retail level, particularly for cosmetics products.

Key milestones

- 2018/19 Q1: Review Tariff Book and industry engagement on tariff lines for review.
- 2018/19 Q2- Q3: Industry applications to ITAC on tariff lines for review and sector desk recommendations to ITAC
- 2018/19 Q4: Identify tariff lines that have a high import value and have potential to be localised.

Lead Departments/Agencies: **the dti**, PharmiSA, BPIA, ITAC, SARS

Supporting Departments and Agencies: National Treasury, NDoH, SOEs, Provincial and local government departments

2. Creation of an enabling environment for development and manufacture of veterinary medicines

Nature and purpose of the intervention

The growth in veterinary markets is set to increase in a sustainable manner as it driven by a variety of factors ranging from:

- increased demand for meat and other livestock products, especially in emerging markets;
- the need for disease control, for both indigenous and possibly trans-boundary;
- increased human, animal and food transport, which creates increased disease risk;
- climatic change and increased productivity which may result in adverse environmental impact in terms of livestock products;
- new molecular techniques which are driving the development of safer, more effective vaccines for effective disease control. (Approximately 60% of emerging diseases are zoonotic in nature and arise in animals, thereby having a direct bearing on control of pathogens that may affect livestock for consumption).

Cattle production is a fundamental element of socio-economic development in South Africa and also a significant contributor to food security and food sovereignty (DAFF 2015). 70% of all agricultural land in South Africa can be used by livestock and game only. Livestock contributes 27% of the consumer food basket

Trading conditions, both in South Africa and internationally, have changed dramatically over time and the volumes of animal products have increased greatly, thus requiring that adequate animal health be maintained to ensure sustainable economic growth.

In South Africa, the veterinary market is dominated by the companion animal market and food animals. Very few companies in South Africa engage in veterinary pharmaceutical manufacture. Although multinationals are well represented in South Africa, none of them currently have their own local manufacturing facilities. However, some multinationals have engaged local manufacturers to do third party manufacture on their behalf.

Local manufacturers include companies such as Onderstepoort Biologics Products (OBP), Deltamune, PharmaQ, Chemical Process Technologies (CPT) and Biotech labs. Their activities include formulation of own products and third-party manufacture.

Figure 4. Breakdown of veterinary medicines market



Source: Vetnosis: Annual Health Industry Review 2014

Key challenges include lack of manufacturing infrastructure, Biosafety Level 3 facilities, upgraded clinical trial facilities, GMP manufacturing facilities, a disease priority list for R&D purposes and relief from DAFF regulatory timelines.

Targeted outcomes

Optimised localisation opportunities presented by state procurement and state infrastructure programmes; reduced import leakage; increased investments in key manufacturing processes and activities for supply into the domestic market; capture of significant after-market opportunities; contribution to the revival of lost manufacturing capacity; increased employment and exports, increased market access at retail level, particularly for cosmetics products.

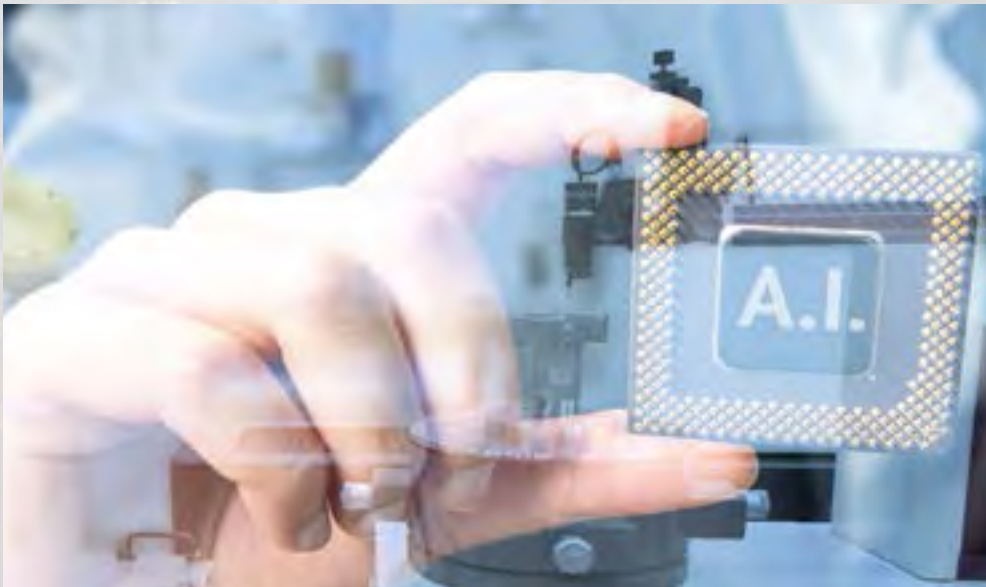
Key milestones

2018/19 Q1-Q4: With DAFF, devise a priority review system for medicines developed locally, through partnership with HEIs and Science Councils.

Lead departments/agencies: **the dti**, DAFF, TIA

Supporting departments/agencies: DST, NT, Science Councils, OBP, local industry etc.

3. Establishment of a Technology Innovation Cluster Programme to promote collaborative initiatives between industry, government and tertiary institutions to enable high-impact industrialisation in the medical devices sector



Nature and purpose of the intervention

The Technology Innovation Cluster Programme (TICP) of the Technology Innovation Agency (TIA), has as its aim to strengthen ecosystems through a cluster-based approach designed to enable, facilitate and mobilise industries in emerging markets; or markets requiring revitalisation; or markets requiring support for growth and expansion.

This will be done through technology innovations and strategic collaborations, exploiting opportunities that lead to knowledge growth, economic and social impact.

TICPs are engines of innovation driven by the needs of private, public or community end-users, turning research results into products, services and technologies that address national priorities within a local and global context. The TICP therefore serves as an autonomous industry vehicle aimed at serving common industry needs. Its existence is therefore dependent on the industry - but typically has a lifespan of 5-10 years.

The TIA-TICP intends to establish a Medical Device and Diagnostic Technology Innovation Cluster (MDDTIC) as a national initiative that will exploit a high concentration of skills, expertise, infrastructure and companies across South Africa with the aim of stimulating and intensifying technology innovation and competitiveness within the sector.

The cluster model advocates for the participation of various entities, both public and private - such as, but not limited to: the DST; the Medical Research Council (MRC); Industry Associations (SAMED, MDMSA); the Industrial Development Corporation (IDC); the Council for Scientific and Industrial Research (CSIR); **the dti**, National Treasury, the National Department of Health (NDoH) and the MRC-PATH Global Health Innovation Accelerator (GHIA).

Successful implementation of the Technology Clusters' objectives is dependent on collaboration across the innovation value chain and ecosystem to promote the overall competitiveness of the industry.

The diagram below depicts typical stakeholders within the industry along the value chain.

Figure 5. Technology innovation stakeholder map



Source: BMI 2016

Targeted outcomes

Formation of Clusters in the sector will:

- improve the competitiveness of the medical device and diagnostics industry;
- enhance collaboration and networking between private sector industry and HEIs to leverage local excellence and expertise in the industry;
- stimulate a technology development environment for RDI activities to develop technology-based products, processes and services;
- facilitate and accelerate the commercialisation of medical devices and diagnostics to market;
- promote medical device and diagnostic manufacturing which addresses diseases of strategic and economic importance;
- leverage funds from local and international funding sources; and
- contribute towards developing skills, expertise and capability within industry.

Key milestones

2018/19 Q1-Q2: Business Case submitted to TIA and **the dti** for support to implement the newly proposed Cluster for Medical Devices

2018/19 Q3-Q4: Implementation of the priority areas identified in the business case including HCD, regulatory compliance, infrastructure requirements etc.

Lead Departments/Agencies: TIA, CSIR, IDC, DST, **the dti**, MDMSA

Supporting Departments/Agencies: National Treasury, NDoH, SOEs, Provincial and local government departments

6.3. Chemicals sector



Situational Analysis

The chemical industry globally is an integral component of industrialised economies. As an industry it occupies a unique position within manufacturing and the wider economy, with a value chain that stretches all the way from upstream primary industries to downstream consumer products. In between, following the chain, outputs feed into many sectors and may comprise building blocks, intermediaries, inputs into end products, and end products themselves.

South Africa has, over the years, built up the largest chemical industry in Africa, with companies and manufacturing capacity across the entire value chain, and some authentic global players. This represents a crucial industrial asset that needs to be supported and sustained if the country is to prevent further de-industrialisation and build economic growth momentum.

Globally, the chemical sector comprises two distinct value chains. In the upstream value chain, processes revolve around the formation of more complex chemical compounds or molecules, and large firms and large capital investments are prevalent. Downstream value chain activities display a greater level of chemical product conversion and formulation processes, and these generally lend themselves to small and medium-sized firms and smaller capital needs.

The following sub-sectors are usually associated with upstream activities: liquid fuels and associated products, commodity organic chemicals, primary polymers and rubbers, commodity inorganic chemicals, and fine chemicals.

Downstream sub-sectors include: pure functional and formulated speciality chemicals, bulk-formulated chemicals, pharmaceuticals, consumer-formulated chemicals (cosmetics), as well as plastic and rubber products.

The South African chemicals sector is notable for its multiple and interlinked value chains, making it complex and highly diversified. South Africa comprises around 0.5% of global chemical production capacity, and petrochemicals comprise about 55% of all chemicals produced locally.

There are significant linkages between the chemicals sector and the manufacturing sector as a whole – approximately 63% by value of all chemical industry outputs were used outside of the industry in 2013. Across a range of indicators, the chemical industry has outperformed broader manufacturing in the last decade.

In 2016, the chemicals sector constituted 3.1% of South Africa's GDP. Although manufacturing as a whole has declined as a proportion of SA GDP over the past two decades, within manufacturing the share held by chemicals has grown, and the chemicals sector has largely recovered from the 2009 crisis.

However, in real terms, South African chemicals production was sluggish over the decade from 2005 to 2015. The global market share of South African chemical producers has likewise not significantly improved over the same period.

Given that the limited size of the South African and regional market makes significant economies of scale hard to achieve, there is a powerful reason to focus on regional integration that can support growing global exports.

Key Economic Data for the South African Chemicals Industry, 2015-2016

ECONOMIC INDICATOR	2015	2016
% Contribution to GDP	3.0%	3.1%
% Contribution to Manufacturing	21.9%	22.8%
Employment	157 706	155 074

Source: Quantec

Trade balance

The export value of Chemicals in 2016 was about R88.8 billion compared to an import value of R162.6 billion, signifying a trade deficit of R73.8 billion - an increase of R2.6 billion over the 2015 deficit. The biggest contributors to the deficit are organic chemicals and miscellaneous products.

Figure 6. Trade Balance for the South African Chemicals Industry, 2011-2016



Source: Quantec

Challenges faced by the chemical sector and related sectors

Domestic chemical firms face challenges on multiple levels; but perhaps the most significant is lack of access to the range of accessible and well-priced feedstocks that some other successful chemical-producing economies have developed.

Being heavily reliant on coal as its only scalable and readily-available feedstock at present, South Africa faces a petrochemical feedstock supply challenge, both in the variety and in the availability of quantities of certain key building-blocks such as ethylene. This contributes significantly to the substantial negative trade balance for the sector.

To develop an advanced manufacturing sector, the economy will need adequate supplies of the full range of chemicals. Without its own crude oil and natural gas raw materials, South Africa faces difficult choices in meeting current and future demand for petrochemicals. It is a complex techno-economic problem.

Consequently, **the dti** has partnered with the IDC to fund a large and costly investigation into possible solutions. The results are expected in the 2020/21 financial year.

Other significant challenges include the following:

- Increase of cheap imports (including custom frauds) that impede local manufacturing;
- Relatively small local and regional markets;
- Lack of R&D along value chains;
- Poor and costly logistical service levels;
- Utility supply shortages and costs;
- Skills shortages;
- Outdated technology and processes resulting in the manufacture of products that are uncompetitive leading to lower local demand and increased imports.

Engagements across most sub-sectors highlighted that chemicals and related sector investments have typically focused on maintaining existing capability and optimising capacity. Attracting capital, at the scale and to the investment timelines associated with many chemicals sector investments, is a challenge which has been amplified over the past few years by the uncertainties of South Africa's political economic environment.

Chemical products are integrated in many of the primary and secondary activities of the economy and therefore the poor performance of the local economy has led directly to a decline in demand for chemicals and related products.

National Chemicals Strategy

In 2017, **the dti** developed a National Chemicals Strategy in response to the challenges and complexities faced by the industry. The strategy aims to serve as a platform to translate key strategic challenges facing the sector into goals and key action programmes that will achieve sustainable growth and increase employment and investment across the sector. Implementation of the strategy will find expression through IPAP and the Chemicals sector desk Business Plan.

Key Action Programmes

1. Establishment of a platform to advance chemical sector growth through practical, industry-specific initiatives aimed at high-impact industrialisation

Nature and purpose of the intervention

Presently, cluster-based economic development is at the forefront of promoting innovation, productivity growth, development and competitiveness. The recently completed Chemicals Sector Strategy identifies the need for a collaborative national approach to the chemical industry's challenges and opportunities.

A priority project is the establishment of a national cluster that engages government and industry in a collaboration to deliver practical initiatives for the industry's sustainability and growth. The initial step will be a jointly-developed government-industry business plan, with all subsequent projects to be executed and monitored against the plan

The programmatic content of the cluster will be guided by the Strategy, which focuses on:

- supply chain development and localisation initiatives;
- investment and export promotion;
- incentive access support; and
- transformation and skills development.

Targeted outcomes

Enhanced competitiveness, increased localisation and ultimately employment growth.

Key milestones

2018/19 Q1:	Establish a steering committee comprised of industry, government, and labour representatives.
2018/19 Q2:	Develop a business plan to inform the Cluster's activities.
2018/19 Q3:	Institutionalise the Cluster.
2018/19 Q4:	Launch Cluster activities

Lead departments/agencies: **the dti**, CAIA, industry

Supporting departments/agencies: EDD, Provincial governments

2. Trade Policy Measures and Interventions

Nature and purpose of the intervention

The trade deficit for the Chemicals and related sectors has been increasing over the last couple of years. In 2016, the trade deficit was R73.8 billion, an increase of R2.6 billion when compared to 2015. An initial analysis of the import data has indicated that the top 60 tariff lines in terms of value accounts for about 45% (R71.8 billion) of the total import value (R162.6 billion). A breakdown is given in the table below.

Table 2. The largest 60 chemical import line items in 2016:

Value	R 71.8 bn
% of all chemical imports	44.2%
Total value of all chemical imports	R162.4 bn
No. of top 60 import line items beginning with "other" or "miscellaneous"	30 (50%) accounting for 31% of the value
Chemicals excluding cosmetics, medicines, plastics and tyres account for	R32.5bn (45%)
Plastics account for	R15.9 bn (22%)
Medicinals account for	R14.7 bn (20%)
Tyres account for	R6 bn (8.3%)
Cosmetics "other" account for	R5.7bn (33%)

Source: Quantec

As illustrated in the table, 30 of the 60 tariff lines are either "other" or "miscellaneous", accounting for about 30% of total import value.

Recently, the Chemicals and related industries have also highlighted widespread customs fraud issues in the sector, with many products being imported through misdeclaration of tariff codes to avoid payment of import duties. This is significant given the potential of cheap imports to displace jobs and decrease growth in the domestic economy.

This therefore requires an in-depth analysis of the "other" and "miscellaneous" categories, with a view to developing more descriptive tariff lines or the creation of new tariff lines where products are manufactured locally and do not have a separate tariff line. This will allow for better monitoring of trade patterns and stronger support for local manufacturing.

Targeted outcomes

- Reduction of the import value under “other” and “miscellaneous tariff lines;
- Unpacking the products coming in under these tariff codes with the intention of creating new tariff sub-headings to ensure more accurate monitoring of imported chemical and related products;
- Creation of opportunities for possible import substitution and local manufacturing for products that have a high import value.

Key milestones

- 2018/19 Q1-Q4: Analysis of tariff sub-headings classified as ‘other’ and ‘miscellaneous’. Form a task team with SARS and the industry associations to create a platform to monitor trade and assist in creating new tariff sub-headings for identified chemical and related products that are manufactured locally but do not have proper tariff sub-headings.
- 2018/19 Q1- Q4: Identify tariff lines that have a high import value and have potential to be localised.
- 2018/19 Q1-Q4: Identify feedstocks that attract import duties although there is no local manufacturer, and which are used for further value addition. Apply to ITAC to remove duties to increase the competitiveness of the downstream industry.
- 2018/19 Q4: Launch Cluster activities

Lead departments/agencies: **the dti**, CAIA, ITAC, SARS

Supporting departments/agencies: EDD

6.4. Cosmetics sector



Situational Analysis

The South African cosmetics sector has been growing at retail level by an annual 6%. It is one of the biggest personal care markets on the African continent, employing about 50,000 people and contributing R25 billion at retail level; while at the manufacturing level, it contributes about R5.2 billion (TIPS, 2014).

Driven by the ‘organic’ factor, there has a fundamental shift towards cosmetics produced from natural ingredients, both globally and locally.

Although exports have been increasing year-on-year, imports have been increasing faster, leading to a growing trade deficit when compared to 2011. This growing deficit can mainly be attributed to a lack of local raw materials.

Figure 7. SA Cosmetics Sector Trade Balance 2007-2016



Source: Quantec

Key Opportunities

- Increasing production of cosmetics products in South Africa, leading to a positive contribution to GDP;
- Capacitating local testing facilities with required skills and technology to produce products in line with international standards - e.g. safety assessments, sun protection testing, mercury analysis;
- Developing a self-sustainable industry;
- Increasing exports and reducing imports of finished products;
- Employment creation.

Key Action Programmes

1. Local content: SOE procurement

Nature and Purpose of Intervention

In support of local manufacturers and their service providers, the Cosmetics sector desk is embarking on leveraging preferential procurement. In 2017, it worked very closely with South African Airways on their cosmetics and amenities kits tender to help stimulate increased local manufacturing of cosmetics sourced by SAA.

In June 2017 A feasibility study was conducted to establish whether amenity kits and cosmetics could be produced locally to meet high-volume demand at reasonable prices.

The sector desk is also focusing on attracting FDI - in collaboration with Investment South Africa (ISA) - and on Southern African regional integration.

The main focus for 2018 will be to facilitate procurement of locally produced personal care/cosmetics products by San Parks, following the model developed with SAA.

Targeted outcomes

- Capacitated local manufacturers with the required skills and technology to produce according to international standards;
- Promotion of "Proudly SA" cosmetics products;
- Increased local content in the cosmetics sector;
- Improved FDI in the sector.

Key milestones

2018/19 Q1-Q4: Work with National parks (SanParks) to encourage procurement of locally produced cosmetics/personal care products.

2018/19 Q1-Q4: Facilitate access to funding for companies, supporting both investments and exports.

Lead Departments/Agencies: **the dti**, EDD

Supporting Departments/Agencies: CTFA, industry, local manufacturers, IDC, SEFA, SoEs, ISA, Trade Invest Africa

2. Compliance and Competitiveness: Natural Ingredients Export Development Strategy

(Compliance with International Regulations and Market Access)

Nature and Purpose of Intervention

South African producers supply a broad range of natural ingredients for the cosmetics, health and food sectors. The South African natural ingredients sector has strong potential to produce natural ingredients, making the sector attractive to invest in. The cosmetics sector desk worked with CBI to inform companies, investors, HEIs and policy makers in South Africa about the potential of South African natural ingredients and how to leverage this potential.

Natural ingredients produced in South Africa currently include the following indigenous species: Aloe *ferox*, buchu, marula, baobab, honey bush, rooibos, devil's claw etc. The natural ingredients sector contributed R101 million to GDP in 2014.

The South African Natural Ingredients Export Strategy encourages production of ingredients that comply with international market requirements and stimulate local value-addition in the production of "organic"/natural cosmetics products in a business-enabling environment.

dti efforts to expand support for the sector are being carried out in partnership with international and national stakeholders, the Department of Environmental Affairs' Biodiversity Economy Strategy, the DST's Bio-economy Strategy, the CSIR, tertiary institutions and the Cosmetic Export Council of South Africa's (CECOSA).

These efforts are also supported by CBI, SIPPO and SECO, and in extended partnerships with UNIDO, SANAS, NMISA, SABS, CTFA and SECO. The aim is to develop ABS compliance training for companies, standards development, technical assistance and funding for SMMEs. Increased participation in exhibitions and trade shows will be achieved in partnership with CECOSA, TISA, WESGRO, SEDA and SIPPO, to promote commercialisation of natural ingredients and products.

Targeted outcomes

- Clear identification of sustainable and traceable value chains that meet international buyer requirements;
- Identification of dedicated support and business-enabling policies and programmes for natural ingredients and products manufacturers;
- Development of standards that are critical for the local and export markets;
- Increased trade volumes of sustainably produced bio-trade products from South Africa that will result in creation of new seasonal and permanent jobs within ABS-compliant value chains;
- Reduction of regulatory hurdles for local compliance, global alignment and optimised market access;
- Capacitation of local testing facilities with required skills and technologies to test in accordance with international standards (e.g. raw material analysis, toxicology).

Key milestones

- 2018/19 Q1-Q4: In partnership with UNIDO, facilitate the development of natural ingredients standards and reference material to encourage quality control and assurance in the value chain.
- 2018/19 Q1-Q4: Facilitate alignment and compliance of the industry with the national Bio-prospecting, Access and Benefit sharing regulations.
- 2018/19 Q1-Q4: Work with SECO to provide technical assistance to SMMEs, access to markets and financial support.

Lead Department/Agency: **the dti**

Supporting Departments/Agencies: SECO, UNIDO, SIPPO, CBI, CSIR-BIDC, IDC, SEFA, CECOSA, SABS, DEA, DAFF, DST, EgoliBio, SEOBi, SAEOPA, ARC, SANAS, NMISA, industry and academic institutions

3. Market access for cosmetics manufacturers

Nature and Purpose of Intervention

In support of local manufacturers of cosmetics and personal care products, the Cosmetics sector desk is embarking on working with *Proudly South Africa* to promote locally produced cosmetics and personal care products. Local manufacturers will be assisted through government funding programmes to produce at reasonable prices in accordance with international standards whilst meeting high local demand and volumes.

In addition to enhancing the local market, identifying investment opportunities and attracting foreign direct investment (FDI), the focus of this intervention will be to facilitate promotion of locally produced cosmetics and personal care products by forming strategic partnerships with the tourism industry and private sector at large.

Targeted outcomes

- Capacitate local manufacturers with required skills and technology to produce according to international standards;
- Promotion of Proudly SA cosmetics products;
- Increased FDI in the sector.

Key milestones

2018/19 Q1-Q4: Work with Proudly SA, Tourism SA, government departments and the private sector to encourage buying locally-produced cosmetics/personal care products.

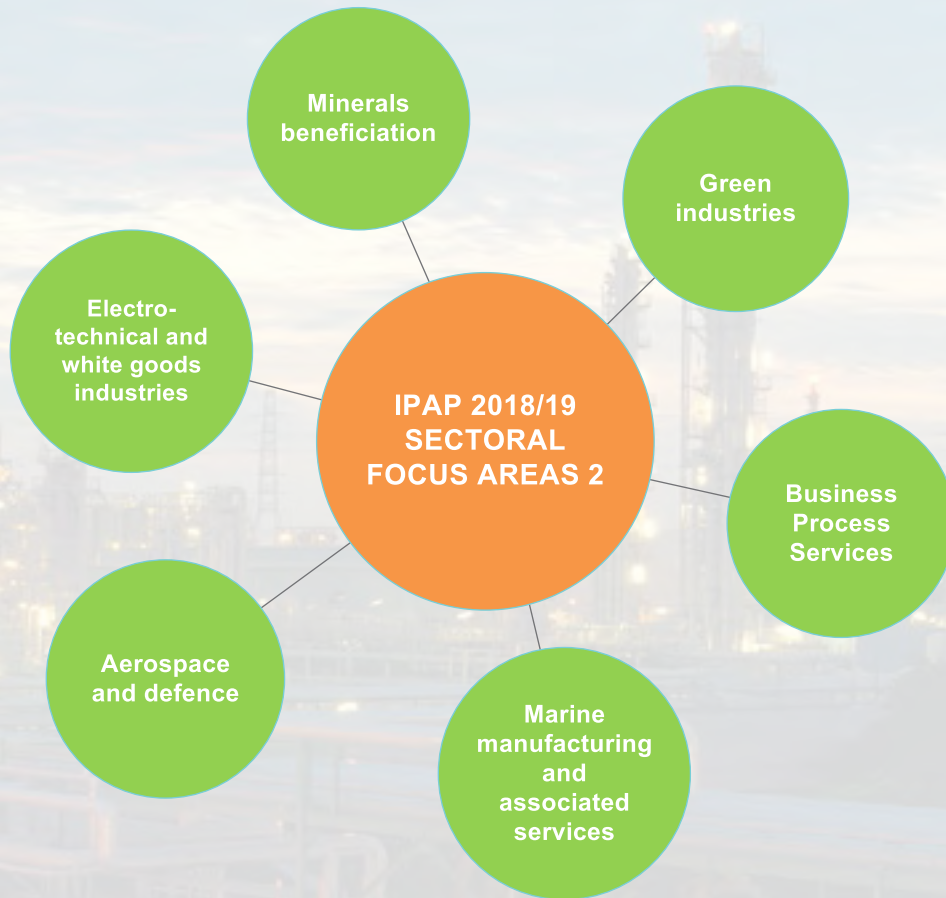
2018/19 Q1-Q4: Facilitate access to funding for investments and exports.

Lead Department/Agency: **the dti**

Supporting Departments/Agencies: Cosmetics Toiletry and Fragrance Association, industry, local manufacturers, IDC, SEFA, Invest SA, Trade Invest Africa, *South African Tourism Industry, Proudly SA*

A fighter jet is shown from a rear perspective, flying through a dramatic sunset sky filled with orange and yellow clouds. The jet is dark in color, and its wings are spread wide. The text "SECTORAL FOCUS AREAS 2" is overlaid in white, bold, sans-serif font across the center of the image.

SECTORAL FOCUS AREAS 2



1. Minerals beneficiation



Situational Analysis

In 2017, the South African mining sector's contribution to GDP declined to 5.1% - down from 6% in 2015 and 5.4% in 2016 - illustrating the extent of the slowdown the sector is facing. The industry attributes the decline both to subdued commodity prices and policy and regulatory uncertainty. The continuing decline has led to mass retrenchments and mothballing of assets and projects.

The current slowdown will affect the long-term sustainability of the sector and its supporting services, which could result in ruinous knock-on effects - especially on mining inputs manufacturers - as both capex and opex levels dip. Overall, the domestic medium to long-term prospects for local suppliers of goods and services is unfavourable and growth in revenues will have to be explored in export markets.

Precious metals are currently subjected to immense strain with low prices and increasing

costs, and most mines operating below break-even. However, coal and iron ore have yielded good growth and continue to inspire confidence.

South Africa has more than 80% of the world's platinum reserves - currently estimated at around US\$ 2.0 trillion - and is home to the three largest platinum mining companies in the world. The platinum mines provide direct employment to 136,000 people and further support 325,000 indirect jobs. Platinum Group Metals (PGMs) are the second largest export revenue generator for South Africa and consequently there is a strong interest in supporting the long-term sustainability of the industry. Currently 39% of platinum demand comes from the autocatalytic convertor industry, 29% from jewellery manufacturing and 23% from investment.

The international drive to reduce greenhouse gas (GHG) emissions in terms of the Paris Agreement commitments could be positive for the industry in terms of the adoption of platinum fuel cell technology. However, as alternate competing battery technologies are adopted, the demand for platinum will remain under threat, with the mining sector exposed to enormous risk. Consequently, there is an urgent need to develop new applications and markets for platinum as well as to provide international markets with reassurance on the sustainability and security of platinum supply.

The fuel cell industry development initiative is aimed at exploring and facilitating new market opportunities for platinum, to ensure the continued growth of PGM mining. In early 2016, the IDC established a steering committee of mining houses, local engineering and manufacturing companies and technology providers to work with government to jointly craft and implement a roadmap for PGM beneficiation in South Africa – with the special focus being on fuel cells.

Globally, the demand for energy storage has risen and continues to grow, especially as a result of the rise of distributed energy generation models. For SA, energy storage systems offer the ability to complement distributed energy generation through transmission and capital deferrals and arbitrage (storing production surplus during low demand periods and meeting higher demand during peak periods). In addition, significant opportunities are emerging in the form of mineral beneficiation-linked energy storage solutions utilising key SA mineral resources like vanadium, nickel and manganese.

Key Action Programmes

1. Interventions for a sustainable steel industry

1.1. Monitoring and evaluation of short to medium term interventions

Nature and purpose of the intervention

Steel is fundamental to manufacturing in SA, accounting for significant value-add and representing about 190,000 jobs in the direct iron-ore, steel making and fabrication industries. Top steel-consuming industries (mining, construction, autos) contribute ~R600 billion to SA's GDP (~15%) and employ ~8 million people (directly and indirectly).

For the past 2 years, since the onset of the global steel crisis, government, in consultation with a broad range of stakeholders, has proposed and implemented a number of policy measures to save the industry from the threat of closure and loss of capacity - balancing support for both the upstream and downstream steel industry.

For the next three years **the dti** will closely monitor the implementation of the programme and general developments in the sector and will participate in local and global forums to ensure continuing support and intervention across the whole steel value chain.

Targeted outcomes

- A competitive primary steel industry;
- A fair price for downstream manufacturing;
- Development of local capacity and capability through increased local content;
- Investment growth along the whole value chain, including technology upgrades;
- Job retention and creation.

Key milestones

2018/19 Q1-Q4: Determine and monitor monthly steel pricing in accordance with the agreed flat steel pricing agreement and monitor all commitments agreed with industry. Submit reports to ITAC Steel Committee.

2018/19 Q1-Q4: Monitor roll-out of Downstream Steel Competitiveness Fund through the IDC-led steering committee.

2018/19 Q4: Annual Report assessing the impact of all support measures (tariffs, designation, incentives) and reciprocal commitments (jobs, investment, pricing); submit recommendations for adjustments where required.

Lead departments/agencies: **the dti**, EDD, ITAC, IDC

Supporting departments/agencies: NT

1.2. Medium term interventions

Nature and purpose of the intervention

The effects of the global steel crisis have been severe as miners, primary steel mills and downstream manufacturers struggle to sustain jobs and invest in new capacity. The impact of the crisis is exacerbated by the fact that the steel industry in SA faces the following deep challenges:

- Inadequate investment in plant maintenance, equipment and upgrades.
- Discontinued production of certain key primary steel products (particularly higher value-added flat products) for mining, tooling, rail and automotive applications.
- Downstream industry facing increasing competition from low-priced imports of finished goods, which continues to erode manufacturing capacity and capability and shrink the local share of domestic and regional markets;
- High logistics costs;
- High electricity prices and other administered charges;
- Difficulty of access to fairly-priced scrap metal is a threat to new and future mini-mill investments (global trends are moving towards more profitable modern mini-mills).

An interdepartmental task team was established in 2017 to develop a short-term framework which sets out the criteria against which a transparent negotiated pricing agreement can be evaluated, approved and monitored. The target is medium to large industrial consumers

supplied by Eskom or a municipality - aiming to provide qualifying consumers with access to lower electricity prices for a period of up to 24 months.

Given the current energy demand-supply situation, the proposed short-term framework is a positive initiative for energy-intensive users. While the intention is to transition to higher levels of value-addition and reduce our dependency on resource-based energy and capital-intensive industries, the smelting and refining stages are required to move to higher levels of value-add with important backward/side-stream linkages.

The following interventions are in progress:

1. **Silicon Smelters Pricing Framework Implementation** – implementation of the pricing framework for silicon smelters.
2. **Approval of short-term framework for energy intensive users** - preventing the closure of more smelters, refineries and foundries through approval and implementation of the broader pricing framework for industrial customers.
3. **Long-term policy, programme and project interventions** - aligning electricity provision with industrial policy: pricing, access to the grid, quality of supply and procurement.

Targeted outcomes

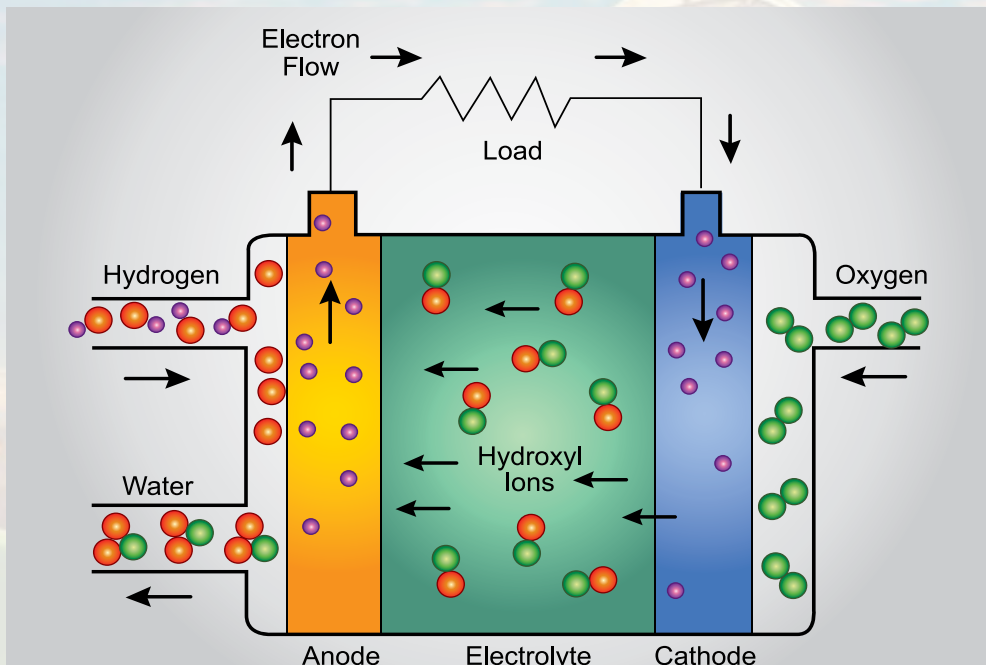
A re-built, globally competitive SA steel industry that supports and balances the interests of both upstream and downstream sectors.

Key milestones

- 2018/19 Q2: Short- to medium-term electricity pricing framework implemented for steel and other energy-intensive users.
- 2018/19 Q3: Chrome export tax proposal submitted.
- 2018/19 Q1-Q4: Trade policy measures implemented (rebates, “other” products, trade remedy and customs duty increases).

Lead departments/agencies: **the dti**, DMR, EDD, NT, ITAC, DOE

2. Expansion of the PGM Beneficiation Industries



Fuel cell technology

2.1. Fuel Cell industry development

Nature and purpose of the intervention

Through a multi-stakeholder approach, South Africa will explore market and industrialisation opportunities in the transport/mobility sector, mining capital equipment and combined heat and power stationary applications.

In 2018/19, the IDC-coordinated steering committee will focus on a value chain analysis to identify opportunities where South Africa will have sustainable competitive advantages to ensure the long-term viability of such opportunities in prioritised market segments.

Several key projects aligned to the roadmap are currently being pursued by the mining companies, the IDC and government:

Mobile fuel cells for transportation

It is envisaged that the biggest enabler for the fuel cell market will be the transport/mobile sector as it will unlock the required volumes and cost reductions for fuel cells to become economically viable. Fuel cells offer opportunities to energise vehicles directly or extend the range of electric vehicles, hence providing viable opportunities for long-distance and heavy vehicles like buses and trucks.

In the medium term, mass transportation initiatives in the metros and by major fleet owners offer an opportunity for the country to introduce fuel cell-based transport solutions that will help reduce GHG emissions.

the dti/IDC study on fuel cell opportunities in the public transportation sector was completed in June 2017, laying out the proposed activities related to the public transportation sector which could stimulate the required demand for the localisation of fuel cells in SA. The action plan suggests that:

- in terms of South African Green Economy and GHG commitments, there is a case to be made to pilot a fuel cell bus deployment within some of the major metros, or any other procurement opportunities;
- there is an immediate need to advance local fuel cell component developments/manufacturers to achieve full commercialisation and become embedded in global value chains.

Stationary Fuel Cells

Following the successful commissioning and operation of a fuel cell to meet part of the Chamber of Mines' building power needs, the dti continues to support the development of stationary fuel cell applications. It has approved funding support for an 8.8 MW fuel cell deployment at a mineral processing facility in collaboration with a local mining house and a global technology partner. HyPlat, the commercial arm of DST HySA Catalysis, is a technology partner for the supply of fuel cell sub-components for the project.

Mining Capital Equipment and Forklifts

In conjunction with the DST, a local mining company, supported by HySA Systems and UWC, has developed a prototype fuel cell forklift with novel metal-hydride technology for

the on-board storage and compression of hydrogen. The forklift and its refuelling station were commissioned in October 2015 and a commercialisation roadmap for fuel cell forklifts is underway.

In order to promote new sustainable markets for PGMs, **the dti** will collaborate with local companies and participating mining houses to support the development of fuel cell LHDs, dozers, locomotives and buses. Fuel cells offer health and safety benefits to conventional diesel as well as electric mining equipment in underground applications. Engagement on the Mine Health and Safety legislation will be a key intervention.

Targeted outcomes

- Increased beneficiation and value-addition to locally produced platinum and expansion/diversification of platinum uses and markets.
- Localisation through local assembly, key component manufacturing and eventually manufacturing of complete fuel cell solutions. Supply chain development for input chemical fuels such as methanol and hydrogen, and the associated logistics.
- Integration of a technology solution under the DST HySA initiative that will enable retro-fitting of locally developed technologies into localised fuel cell solutions.

Key milestones

- 2018/19 Q1: Proof of concept on other forklifts using Metal Hydride and LOHC market quantification.
- 2018/19 Q2: Fuel cell bus pilot roadmap (IDC, Mining Companies, DBSA, **the dti**).
- 2018/19 Q4: Construction commencement of the 8.8 MW stationery fuel cell, supported by dti Critical Infrastructure Funding; construction of LHD, locomotive and bus prototypes.

Lead departments/agencies: **the dti**, DST, IDC, DOE, DEA, DOT

3. Energy Storage Development

3.1. Li-ion battery precursor project

Nature and purpose of the intervention

With funding from the IDC, the Black Industrialist Programme is supporting the commercialisation of the Thakadu nickel-sulphate project via the establishment of a R251 million, 25,000 t/a nickel-sulphate plant in the NW (Lonmin Refineries) based on the Mintek proprietary process. Production starts in 2018. The chemical product is used globally in lithium-ion batteries and off-take agreements are in place with global customers.

Complementary to the above project, the DST has launched a Strategic Manganese Precursor Development Programme, responding to the need for SA to beneficiate its manganese resources. The programme was initiated through the acquisition of intellectual property and expertise from Delta EMD (Pty) Ltd. and is co-hosted by the University of Limpopo.

The long-term objective of the Manganese Precursor development work is to establish a new manganese beneficiation plant in South Africa that will supply precursor material to future local and global Lithium Ion Battery (LIB) producers.

The intervention will include engagement with Special Economic Zones (SEZs) to leverage the benefits of locating the facility in such zones, as well as engagements with potential investors.

the dti will engage upstream manganese mining and processing companies to be part of the product development process.

Targeted outcomes

- Beneficiation of local minerals for application in energy storage solutions.
- Manufacturing of Li-ion battery components in South Africa for the export market.
- Partnership with battery producers for uptake of locally produced precursor materials.

Key milestones

- 2018/19 Q1: Thakadu nickel sulphate project MOA with manganese precursor project.
- 2018/19 Q4: Manganese energy storage development framework including pre-feasibility and identification of a suitable SEZ for the location of a manganese precursor manufacturing facility.

Lead departments/agencies: **the dti**, DST, UL

Supporting departments/agencies: TLIU, CSIR, industry associations

3.2. Demonstration of energy storage technology in South Africa

Nature and purpose of the intervention

The IDC-led energy storage steering committee has identified potential SA use cases for energy storage, including transmission and capital deferrals, arbitrage (storing production surplus during low demand periods and meeting higher demand during peak periods), voltage support, frequency and regulation.

At this stage, the primary focus is on demonstration/commercial site deployments that will assist in proving the technology and business cases in the SA environment. Such deployments are essential to obtain first-hand experience and knowledge to facilitate the establishment of a policy and regulatory framework that supports the large-scale roll-out of energy storage.

Given the projected future global up-take of vanadium energy storage applications, the initial focus is on the development of a vanadium electrolyte production facility, followed by a vanadium redox flow battery assembly/manufacturing plant in South Africa. This will facilitate new industrial development opportunities with a global market perspective.

This project will support:

- Increased beneficiation of South African vanadium resources;
- localisation of vanadium redox flow battery technology in support of market development in SA and regionally.

Targeted outcomes

- An enabling environment to successfully demonstrate the value proposition of energy storage;
- South African participation in the growing energy storage sector, thereby stimulating demand for South African mineral resources and the establishment of a local manufacturing industry;
- A successful demonstration/commercial site, illustrating a technical and commercial solution that could be replicated /exported to other countries, especially in the region.

Key milestones

- 2018/19 Q2: Assess regulatory policy framework and funding support required to develop an energy storage demonstration/commercial site in SA.
- 2018/19 Q2: Implementation and evaluation report of the vanadium redox flow battery demonstration site at the Eskom Research and Innovation Centre in Rosherville.
- 2018/19 Q4: Development of a funding framework for energy storage-based distribution solutions (transmission and distribution capital deferrals, voltage support, frequency regulation, transformed start-ups, etc) with the major off-takers being Eskom and municipalities.

Lead departments/agencies: **the dti**, DOE, IDC, DST

4. Growing the market share of domestic manufacturers of mining equipment and components through identifying opportunities for localisation, supplier development and export growth

Nature and purpose of the intervention

The Mandela Mining Precinct, a public-private partnership between the Chamber of Mines (CoM) and government (DST, **the dti**) will be formally launched during May 2018. The partnership will be funded by the DST and **the dti** to a value of more than R220 million (until 2021). The CoM will finalise its contribution on an annual basis, in addition to the R33 million which was committed for 2018.

This platform has been created to drive local content and coordinate the interests of both mining companies and manufacturers. The common objective will be to streamline the supply chain and collaborate on opportunities for co-development of equipment, thus increasing the value and extending the life of gold and platinum mines to 2050 and beyond.

Whilst there was previously little coordination amongst manufacturers of mining equipment, **the dti** has recently played a pivotal role in funding and directing the agenda of two new clusters within this space.

In mid-2017 it funded the establishment and programme development of the Mining Equipment Manufacturers of South Africa (MEMSA) to a value of R8 million. It also provides ongoing support to the South African Mineral Processing Equipment Cluster (SAMPEC). Both clusters, MEMSA and SAMPEC, are located within the Mandela Mining Precinct.

The Mandela Mining Precinct is positioned as the central coordinating institution for all mining-related R&D activity aimed at developing the next generation of mining systems. Six R&D streams are being collectively directed by projects championed by the mining companies. The fundamental aim is to identify greater efficiencies in the extraction and processing stages of the value chain, ultimately reviving the long-term viability of deep-level mining.

The projects include:

- Modernisation of current operational mines.
- Mechanised mining for gold and platinum.
- Non-explosive rock breaking.
- Advanced ore-body knowledge.
- Real-time information management systems and Mining 4.0.
- Optimisation of the mining supply chain.

Whilst domestic OEMs are steadily growing their order books, albeit in testing times, the foreign-owned counterparts have heeded **the dti**'s call to increase local content and localise elements of production. A major global mining equipment supplier recently committed to a R1.3 billion localisation programme; another has launched its first locally- manufactured LHD for the South African and other regional markets.

Currently, efforts are being made to bring foreign OEMs into the Mandela Mining Precinct's mainstream activities in order to seek opportunities for technology and skills transfers and co-develop partnerships leveraging the OEMs' innovation and R&D capabilities.

The competitiveness of the South African mining industry will be critical to its survival, especially when commodity prices are stagnant and operating costs are rising. **the dti** is working with leading mining companies (Sibanye, Anglo-American, South 32, Impala, AARD, RHAM, Multotec, etc.) who have come to realise that in order to remain competitive they must innovate and use new technologies - sometimes from lateral industries - to transform their operations. This includes seeking improvements in mine safety, real-time information management, artificial intelligence and environmental impact issues.

New mining methods will be central to enabling the sector to remain a global player in an industry that is moving closer towards the 'digital mine' of the future, integrating the entire value chain. Mining 4.0 is fast becoming a reality and technology is the key driver.

Targeted outcomes

- Greater and better-coordinated collaboration between the domestic manufacturers of equipment and components and the providers of supporting services.
- Increased purchase by mining companies of locally produced items.
- Growth of export sales in goods and services to select African markets by developing an Export Roadmap to exploit high-priority mining projects. (Adopting an "SA Inc" approach).

Key milestones

- | | |
|---------------|--|
| 2018/19 Q1-Q4 | Further integration of leading manufacturers into the mining supply chain to increase sales to domestic mining companies through the Mandela Mining Precinct collaboration platform. |
| 2018/19 Q1-Q4 | Roll-out of implementation plans for the identified product business cases to increase local content in mining procurement. |
| 2017/18 Q1-Q4 | Implementation of the Export Roadmap Action Plan with key stakeholders. |

Lead departments/agencies: **the dti**, DST, CSIR (TLIU), IDC

Supporting departments/agencies: DMR, DPME, DIRCO, EDD

1.1. Gas Industrial Policy



the dti's intention is to stimulate gas-based industrialisation in South Africa in a phased manner, starting with a short-term pump-priming phase that supports the import of liquefied petroleum gas (LPG) and liquefied natural gas (LNG) into key South African ports by the Department of Energy. Also on the agenda is the facilitation of early stage development of onshore South African gas resources, including coal bed methane and shale gas, and the further exploration of offshore potential.

the dti anticipates significant expansion in the import of regional natural gas resources from Mozambique, building on the volumes already imported via the ROMPCO pipeline from the Pande and Temane fields operated by Sasol. As the world-scale Rovuma Basin discoveries in Northern Mozambique are commercialised, **the dti** will work to support a regional gas strategy and the entry of private sector players to ensure that a significant volume of these new resources are delivered into the South African gas market, either via LNG and ship or (over the longer term) via pipeline.

The expansion of gas supply into the South African market - via the development of domestic resources and the expansion of volumes from Mozambique - should produce affordable gas prices capable of underpinning a significant natural gas-based re-industrialisation of the South African economy. **dti** policy will support the development of infrastructure and competitive markets to yield gas at the lowest possible prices.

Development of domestic industrial gas markets

- Evidence from other jurisdictions, most notably the USA and Qatar, suggests that an abundant and cheap natural gas resource can dramatically revitalise wider manufacturing and industrial activity.
- Gas markets are developed in phases over many decades. The key short-term objective is to attract investors to explore and develop South Africa's natural gas resources. This objective can be facilitated by developing natural gas markets in the following ways:
- seeding the market with LPG (which requires expanded import infrastructure and regulatory reform);
- commercialisation of small pockets of indigenous natural gas and coal bed methane (CBM);
- initial small-scale LNG imports, followed by subsequent large-scale LNG importation (from regional and global sources).

These developments will play a vital role in expanding domestic industrial gas utilisation and capitalising the infrastructure required to connect supply to growing demand. Competition between various sources of significantly increasing supply will assist in driving affordable gas pricing.

In the longer term (15 years +) the main objective is a vibrant gas industry delivering affordable and secure gas supply to the heavy industry, manufacturing and transport sectors.

Key Action Programme

5. Developing a regional gas economy

Nature and purpose of the intervention

The 37th SADC summit, held in August 2017, decided to establish a Regional Natural Gas Committee and Task Force. The broad mandate of the Committee is to support the growth of a regional gas economy through the development of a SADC Gas Master Plan.

the dti will participate fully in this work, supporting the alignment of regional gas policy and driving the regulatory coordination required to enable significant onshore utilisation of natural gas volumes in the region.

Supplier Development

In addition to facilitating the growth of a regional gas industry, there is huge potential for onshore value from natural gas in servicing upstream exploration and production activities both in South African – onshore and offshore – and in the region, particularly in Mozambique, Angola and Tanzania.

Finding and developing natural gas resources requires specialised equipment and services including drill rigs, geological services and piping. If these resources are available in the region at competitive prices, it will help to lower the costs of extracting and delivering gas to markets, as it will allow for cheaper than US dollar-priced imports. In turn, this should reduce the cost of gas faced by downstream gas customers, whilst at the same time stimulating different value chains within Southern African economies.

The international oil and gas industry operates on stringent technical, health and safety standards. Companies aspiring to supply this industry will not only have to meet these requirements but will have to be as competitive as the foreign companies currently operating in this space.

What will be required is a coordinated and collaborative supplier development framework developed in conjunction with the private sector. **the dti** will provide leadership and drive policies and stakeholder coordination that facilitate the optimum usage of South African goods and services for upstream activities in South Africa and the region.

It will also work with the upstream industry and its industry bodies to map required procurement for its activities, whilst simultaneously building supplier development databases, working with the goods and services industries in South Africa and facilitating matches where appropriate. A critical focus will be pivoting South Africa's traditional mining skills-set to support the oil and gas value chain.

Key milestones

2018/19 Q1-Q4: **LPG Sector Strategy: the dti** will work closely with the Departments of Economic Development, Energy and Labour to address the challenges currently hampering the growth of the LPG sector.

These include, but are not limited to:

- commitment to substantially increasing the size of the LPG market by following a competitive industrial-growth-through-LPG-imports strategy;
- continued commitment to the 'cylinder exchange' system of supply;
- revising the cylinder deposit price regulation to match import parity;
- substitution of price regulation by price monitoring;
- minimisation of wholesale LPG licensing and the introduction of certification for LPG cylinder fillers;
- shifting the tax incentives currently given (from paraffin to LPG), once the LPG supply bottlenecks have been removed;
- alignment of the provisions of the Petroleum Pipelines Act, the Ports Act and the Petroleum Products Act in so far as they relate to LPG;
- support for exemption from the Competition Act that will allow small LPG importers to aggregate their needs to lower LPG costs;
- increasing prosecution of illegal cylinder fillers and raising the deterrent (fine) for illegal filling;
- improved verification of adherence to safety specifications of imported cylinders;
- exploring the compulsory certification of cylinder fillers;
- increasing funding for the LPG health and safety inspectorate.
- **LNG-to power programme support: the dti** will continue to work closely with the DoE

to leverage its LNG-to-power programme for further industrial gas market development.

- **Upstream exploration to drive discovery and production of domestic resource:** key to unlocking gas exploration and production is finding an investor-friendly resolution with respect to the amendments of the MPRDA. **the dti** will continue to engage the DMR and industry to seek a successful conclusion to this process.

Key milestones

2018/19 Q1-Q4: **Developing a Regional Gas Economy**

the dti to work closely with the NEPAD Business Foundation (NBF) and the SADC Regional Natural Gas Committee/Gas Task Force to develop a regional gas master plan.

2018/19 Q1-Q4: **Supplier Development**

Put in place a supplier development programme that will develop the specialised suppliers of strategic components and services along the oil and gas value chain.

Lead departments/agencies: **the dti**, DST, CSIR (TLIU)

Supporting departments/agencies: SAOGA, OPASA, ONPASA, the DMR, the DoE, EDD, Transnet, Eskom, NEPAD Business Foundation (NBF) and the SADC Regional Natural Gas Committee/Gas Task Force.

2. Green industries



Situational analysis

Global

The adoption of the Paris Agreement on 12 December 2015, where the world agreed to limit the average temperature increase to well below 2°C, was a major historic turning point on climate change. The ambitious outcome from Paris was the result of an increasingly serious collective recognition by governments, business, investors, regional and local authorities of the urgent need to design and implement strategic policy interventions to address the multiple challenges of climate change.

For business this is a turning point: away from investment and innovation in carbon-intensive technologies and towards innovation and the development of next generation solutions.

The global race is now on to grow and capitalise on these new opportunities; and it is already evident that economies of scale, technological improvements, greater competition in supply chains and the right policy conditions have started a continuous process, driving down the cost of new technologies to already price-competitive levels in many sectors, including energy and transport.

Industrial policy developers are becoming increasingly aware of the potential threats these global developments pose to our traditional carbon energy-based industrial system. There is no doubt that opportunities will be few and far between in the years to come unless we embrace new efficient production systems and technologies and implement policies that create demand for the next generation of clean products and services.

Local

In 2010, the South African government developed the Renewable Energy Independent Power Producer Programme (REIPPPP) to contract with private power producers to supply energy to the national grid. This was done to enhance electricity supply at a time of shortages, to encourage generation from renewable sources and to provide a stimulus for manufacturing through the procurement of capital goods for the new plants. Many of the major inputs for renewable generation are designated for local procurement.

For a number of years this proved a highly successful Green Economy project, attracting investment to the value of R201.8 billion, contributing 3,162 MW of electricity generation capacity and mandating South African entity participation of 40%, including broad-based black participation in the form of ownership, economic and socio-economic benefits across the term of the contract (not only at the time of bidding). Currently, BEE Participation (including Community Trust Participation) in South African entities delivering projects that have reached financial close stands at 53.9%.

Black South Africans own, on average, 31% of project equity (shareholding) in the projects which have reached financial close, with local black communities owning around 11% of such projects. The total dividend benefit that will flow to community trusts through the contracted IPP projects over the period of the PPA amount to R23.22 billion. Shareholding by black South Africans was also secured across the value chain. Engineering, Procurement and Construction (EPC) and Operating and Maintenance (O&M) contractors were required to

make commitments in respect of shareholding by black people as well as top management by black people - which must be maintained for the full lifespan of the project.

From a policy standpoint, Eskom needed to play a central role to make the programme work - through the purchase of the electricity generated by through the REIPPPP. But because Eskom did not directly benefit from the programme, privately generated electricity was basically a lost opportunity for them. The massive electricity price increases over the past five years in South Africa further led to significant downward adjustments in consumer demand for electricity, especially from energy-intensive consumers. It is no surprise, then, that Eskom eventually explicitly opposed and delayed expansion of the REIPPPP because of concerns about its own falling sales. This resulted in a massive decline in renewable energy-based industrialisation. More importantly, a growing and globally competitive local industry became paralysed, sacrificing the opportunity to participate in the next energy revolution - namely storage and the associated manufacturing potential (specifically vanadium mining backward linkages).

The slow and intermittent roll-out of the National Solar Water Programme is another example of a sub-optimal realisation of industrial opportunity. According to the 2017 Estimates of National Expenditure, the National Solar Water Programme had installed 121,519 solar water heaters for a total expenditure of R1.97 billion by the end of the 2016/17 financial year.

This means that just over 10% of the planned installed systems were realised in four financial years - a far cry from the planned installation of 1 million solar water heater systems by the close of the 2014-15 financial year - for which R4.7 billion was to be allocated over the medium term in the 2012/13 financial year. This again highlights the difficulty of creating new green industries through the lever of public procurement.

Key Action Programmes

1. A Policy Roadmap for Climate-Compatible Industrial Development

Nature and purpose of the intervention

the dti, supported by TIPS, has finalised two pilot studies on the economic, social and environmental profile of the iron and steel value chain and the petrochemical value chain in South Africa. The climate-compatibility of these sectors was compared to international

competitors and resilience/vulnerability assessments were carried out. Possible solutions were identified, and an implementation plan is being formulated for each sector. This was in line with the first phase of the policy roadmap for climate-compatible industrial development.

Key milestones

With TIPS' support and in collaboration with the DEA, **the dti** will continue this work in 2018/2019, taking the following steps:

2018/19 Q4: Conduct three additional sector value-chain studies: (i) Cement; (ii) forestry; and (iii) aluminium.

This work will include:

- developing a profile of the selected sectors (from economic, social and environmental perspectives);
- establishing the climate-compatibility of the sectors (notably compared to international competitors);
- carrying out a resilience/vulnerability assessment based on:
 - their existing climate-compatibility;
 - their existing mitigation potential;
 - their exposure to both direct and indirect climate risks (direct environmental impacts, indirect environmental impacts, climate change response impacts, including market dynamics);
- assessing the possible solutions and formulating an implementation plan, to be reflected in the sector strategy and broader industrial policy (and integrated with sector emission targets and the Carbon Budget and Mitigation Plan of DEA).

2018-2019: Continue with Internal sectoral capacity building within **the dti** on climate change and industrial development.

Lead departments/agencies: **the dti**, DEA

Supporting departments/agencies: DoE, EDD, TIPS, NCPC

2. Systemised resource efficiency data collection and reporting

Nature and purpose of the intervention

From a policy perspective government must set the Green Economy rules and provide the signals and conditions necessary to adjust economic behaviour. The traditional measure of contribution to GDP often creates the perception that environmental policies work against the grain of the economy resulting in mixed messages for business.

The National Cleaner Production Centre (NCPC) has been collecting data on the use of energy and other resources in industry for many years. Improved ability to collect, analyse, interpret and report will support policy development and alignment of environmental and industrial objectives. This project is aimed at improving the systems and processes to gather and report on data relating to energy and water use, as well as the waste emissions patterns of industrial sectors and companies.

Targeted outcomes

A database, housed at the National Cleaner Production Centre South Africa, capturing resource (water, energy, raw materials) use and resource savings statistics in industrial sectors and plants.

The resulting data will be available for use by the various government departments requiring reporting of such data in national environmental reporting frameworks and for tracking progress against agreed international mitigation targets.

Key milestones

- 2017/18 Q4: Launch of an information management system with a web-based front-end to capture energy, water and waste use patterns by companies, populated with data from NCPC-SA assessments since 2009.
- 2018 – 2020: Annual analysis of data and publishing of a report on industry resource use and savings patterns.
- 2018 – 2020: Reporting of data as and when required by national stakeholders.

Lead departments/agencies: NCPC-SA, **the dti**

Supporting departments/agencies: Sanedi, DoE, DEA and DWAS

3. A national strategy to utilise appropriate measures and technology to ensure water security and support the development of a local base of technology and service providers in the sector

Nature and purpose of the intervention

Demand for water in South Africa is projected to be 17.7 billion m³ by 2030, while the current supply only amounts to 15 billion m³. Water supply in South Africa is constrained by low and unpredictable rainfall patterns, limited underground aquifers, and reliance on significant water transfers from neighbouring countries.

Future water supply and demand will fundamentally challenge economic and social development norms in South Africa and will need to be carefully managed to ensure sustainable growth. Policy makers will need to resolve tough trade-offs between agriculture, key industrial activities such as mining and power generation, and large and growing urban centres.

We need to assure sufficient raw or “upstream” water resources, implement the most appropriate technical solutions for supply and the improvement of water productivity, and implement the right incentives to change the behaviours of water users, whilst promoting investment to address the infrastructure backlog and water saving technologies.

It is important to understand the role that the private sector can play in this effort and to incorporate this into what has always been a natural monopoly solely managed by the public sector. At stake are both economic prosperity and environmental health.

Targeted outcomes

A fact-based vision for water resources in South Africa to help identify metrics, such as:

- the supply-demand gap;
- a portfolio of least-cost technical solutions to address this gap; and
- a comparison of the technical options for new supply with options to shift the set of underlying economic activities away from the most water-intensive uses.

The vision must also guide future planning for water in a way that integrates it with the direction of the economy as a whole.

Key milestones

- 2018-19: National water supply and demand analysis with high level case studies and/or scenarios.
- 2018-19: A cost-curve of incremental water availability to assess the potential and costs of a set of measures to close the projected deficit between water supply and demand. The cost curve should also provide a framework for technology providers to benchmark their products and services to be able to estimate market potential and cost competitiveness with alternative solutions; and it should also provide guidance and transparency on where infrastructure is most needed, and where alternative solutions may prevail.
- 2018-19: A “payback curve” to evaluate the returns that any given measure would generate against the capital needed to fund it, as perceived by the end-user or adopter of the measure.
- 2019-20: Use the robust fact base generated to describe the implications for stakeholders and policymakers by quantifying the barriers to adoption and identifying the policy levers most likely to be address these barriers effectively.

Lead departments/agencies: dti, TIPS

Supporting departments/agencies: DST, DWAS, WRC, TIA

4. Industrial Water Efficiency Project

Nature and purpose of the intervention

South African industry is traditionally resource-intensive, a characteristic which is proving to be a growing challenge from both an environmental and a cost perspective. Supply shocks in energy provision have already begun to spur action by industry to adopt more energy-efficient production methods.

Countrywide droughts in recent years – and, in particular, the prolonged drought and water crisis in the Cape region of the country - have now placed sustainable water use and supply

in the national and world spotlight. Companies must address the pressures of increasing water insecurity, coupled with the rising cost and environmental considerations attached to industrial water use.

The Industrial Water Efficiency Project aims to support South African industry to transform water use patterns in a bid to improve efficiency of water management by industrial companies. The project focuses on creating partnerships that will enable more supportive policy: generating training programmes to increase water-related skills in industry and assisting industry to assess and implement water efficiency in their plants.

Targeted outcomes

- Improved water efficiencies and waste-water management in participating industrial and commercial companies.
- The transfer, uptake and adoption of new water technologies through demonstration projects, to assist with de-risking innovations.

Key milestones

2018-19:	Water efficiency demonstration assessments used to identify new techniques and technology opportunities for implementation.
2018-19:	Development of a best practice water management approach for implementation at industry/company level.
2018-19:	Development of skills training modules for water management and water efficiency in industry.
2019-20:	Technology implementation support through structured implementation projects and/or facilitation of access to relevant technology suppliers.

Lead departments/agencies: NCPD-SA, **the dti**

Supporting departments/agencies: DST, WRC, TIA

5. Industrial Energy Efficiency Project

Nature and purpose of the intervention

The second phase of the South African IEE Project (2016-2020) continues the work done in Phase I - to support industry in changing energy use patterns to be more efficient and sustainable. The project aims to increase industrial energy efficiency in South Africa to contribute to national efforts to improve energy security and electricity supply continuity, whilst seeking to enable an energy transition where GDP growth is not continually constrained by energy shortages and rising prices.

This will be achieved through the implementation of energy management systems (EnMS) and energy systems optimisation (ESO) in industrial plants, together with the capacitation of energy experts to support industry implementation.

Targeted outcomes

- Mainstreaming of energy management standards, based on ISO 50001 in industrial companies, to ensure sustained energy savings.
- Development of energy efficiency experts in industry with special focus on increasing the number of women capacitated and empowered as experts in industrial energy efficiency.
- Measurable energy savings in participating industrial and commercial companies.
- Development of tools and platforms for learning and awareness of energy management in industry.

Key milestones

2018-19:	Energy audits in SMEs with trend reports on SME energy use.
2018-19:	Energy baseline studies in selected sectors.
2018-19:	Industrial plants demonstrating energy efficiencies and showcasing results through case studies to set best practice and encourage uptake.
2018-19:	Number of expert women trained in energy efficiency.
2018-19:	Carbon emissions mitigation figures calculated and reported.

Lead departments/agencies: NCPD-SA, **the dti**

Supporting departments/agencies: DEA, DST, DOE, Sanedi

6. Resource-efficient and cleaner production skills development

Nature and purpose of the intervention

The skills development programmes offered in resource-efficient and cleaner production (RECP) are aimed at growing the South African skills set available to industry to facilitate energy efficiency, water efficiency, waste reduction and reduction of carbon emissions. Professionals from industry are trained through occupational training courses, whilst an internship programme equips young graduates with RECP skills.

Targeted outcomes

- An increased supply of specialist skills in energy optimisation and resource-efficient cleaner production by stimulating demand and supply of all relevant skills, while promoting formal recognition and the credibility of the relevant training programmes.
- Improved employability of young engineering and science graduates by equipping them with specialist RECP skills.
- Facilitation of energy, water and materials savings, as well as improved waste management in industrial companies where interns or experts are trained.

Key milestones

2018 – 2020:	Develop 15 RECP practitioners per year through the NCP-C-SA Internship Programme.
2018 – 2020:	Develop 40 specialists with UNIDO-certified skills across 5 different disciplines in Energy Optimisation and Resource Efficient and Cleaner Production.
2018 – 2020:	Develop new trainers for specialist courses in Energy Optimisation and RECP, enhancing the capacity of the training and education industry to meet the demand for these skills.
2018 – 2020:	Capacitate 5 institutions from the public and private training sector to offer training against occupational qualifications in energy efficiency.
2018-19:	Carbon emissions mitigation figures calculated and reported.

Lead departments/agencies: NCP-C-SA, **the dti**

Supporting departments/agencies: DWS, WRC, DOE, DHET

7. Professionalisation of specialist occupations in the resource-efficient and cleaner production fields

Nature and purpose of the intervention

Recent years have seen the proliferation of green reporting requirements as well as the development of standards and certification programmes in this space. At this stage, much of this reporting is voluntary, but long-term plans of government and other bodies envisage mandatory reporting of this nature.

Adaptation to these requirements at firm level within industry has been slow. This lag can partly be ascribed to a lack of awareness of the benefits of making the necessary changes to business reporting, and partly due to the lack of infrastructure for acquiring and vetting the necessary monitoring, evaluation, verification and auditing services.

This project aims to begin addressing these gaps and will involve sensitising industry to the need for evolving business reporting and preparedness for the inevitable compulsory green reporting requirements of the future. It will also involve implementing standards for resource efficiency professionals who could support industry in the transition to a low-carbon economy – including, but not limited to, energy and carbon reporting.

Targeted outcomes

The establishment of a professional body mandated to develop recognised professionals qualified to assist industry in complying with existing and future regulations pertaining to the submission of energy plans, carbon emission reports, tax incentives and activities related to emissions and other forms of environmental reporting.

Key milestones

2018-19:	Awareness-raising aimed at highlighting key issues in the transition to a low carbon economy and the resulting reporting requirements.
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Lead departments/agencies: NCP-C-SA, **the dti**

Supporting departments/agencies: Sanedi, DOE, DEA, National Treasury and DWS

3. Business Process Services



Situational analysis

The global Business Process Services (BPS) market has evolved into an ecosystem which is now higher-end, more sophisticated and characterised by many cloud-based applications. Leading offshore destinations have repositioned themselves from a narrowly-focused BPO approach to being excellent players in a broader IT-BPM industry which includes, beyond BPO, Information Technology Outsourcing (ITO), Knowledge Process Outsourcing (KPO) and Legal Process Outsourcing (LPO). These services serve a number of verticals, with activities ranging from Healthcare to Banking, Financial Services and Insurance (BFSI). South Africa has gained particular international recognition as a top Legal Process Outsourcing (LPO) destination, able to offer expertise similar to that of European countries.

In 2016, several milestones were achieved in the BPS sector as a result of strong partnerships between industry and government. At the 2016 Global Sourcing Association (GSA) awards in London, South Africa was once again named “Offshoring Destination of the Year”, an award it had previously received in both 2012 and 2014. The consistency with which the awards have been received confirm South Africa’s position as an industry leader and a world-class service destination in the BPS value chain.

New technologies in this sector have brought about a need for new thinking and new ways of doing things. The introduction of cloud-based computing and technologies have changed the traditional business operation model at a rapid rate. Coupled with this, the advent of the smartphone, global video conferencing, and an overall shift to digital across business areas are allowing employees more flexibility within their working environments and doing away with the traditional office.

BPOs and contact centres are realigning their business operation models to upscale employment opportunities and increase quality of life for agents whilst still achieving significant cost savings and efficiency gains. According to the Global Telework survey of 2016, working from home, also known as ‘telecommuting’ is one such method which is fast gaining popularity. 15 % of the operations in the Europe-Middle East-Africa (EMEA) region have a telecommuting policy and South African BPS operations are no exception.

In 1998, Lufthansa became the first offshore operation to outsource to South Africa. Following the successful rollout of the Lufthansa operation, South Africa expanded into other global BPO markets and it is now home to operators such as Aegis, Capita, CCI, EXL, Merchants, Barclays, Conduent, Infosys, Genpact, Teleperformance, Webhelp and WNS. It is also the offshore destination of choice for International brands such as Amazon, Asda, Bloomberg, British Gas, Direct Line Group, iiNet, O₂, Shell and Shop Direct.

South Africa’s strong position derives in no small measure from two key **dti** initiatives – the BPS Incentive Scheme and the Monyetla Work Readiness Program™. Since the launch of the revised BPS incentive in 2014, an additional 35 projects have been approved for new investments or expansions, bringing the number of agents employed by offshore operations to approximately 30,000 – 91% of whom are under the age of 35.

The Monyetla Work Readiness Program has supported over 16,000 unemployed youth through its skills development offering, which has made them highly employable in the BPS Industry.

Table 1: Growth of the South African BPS sector

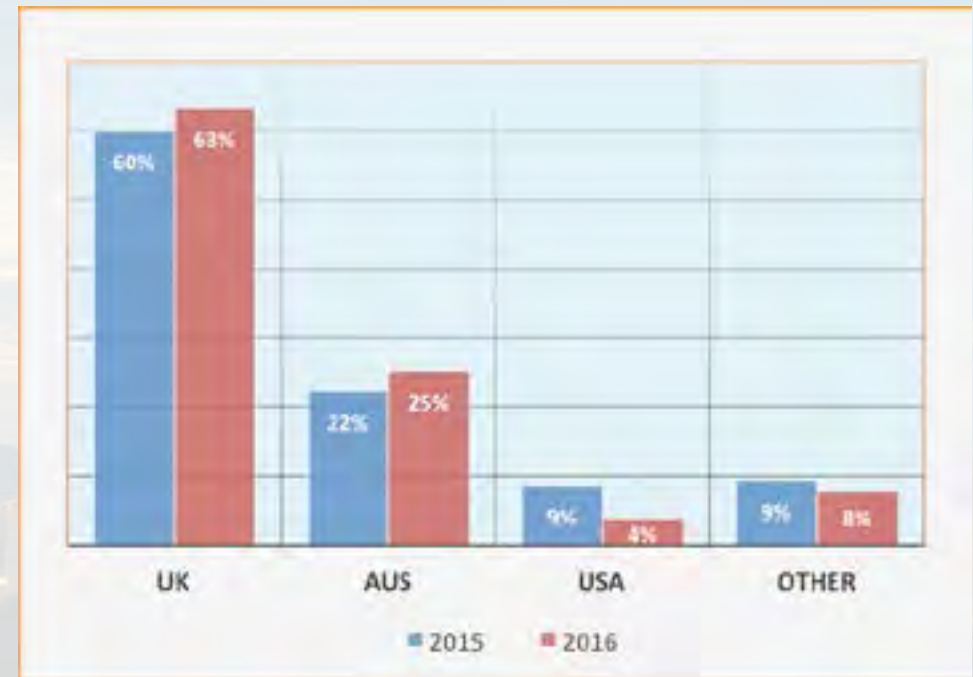
Programme	Variable	Contribution 2007-2010	Contribution 2011-2014	Contribution 2015- 2017
BPS Incentive	Employment	9,295	9,077	14,727
MWRP	Trained	4, 467	9, 356	6,642
MWRP	Employment	3, 483	7, 268	5,681
BPS Incentive	Export Revenue	R349m	R5,9bn (projected)	R19,784,804,437 (Projected over 5 yrs.)

Source: the dti

The local BPS industry and social partners have also contributed with significant investments and some brilliant initiatives. Significant growth has been realised in reaching English-speaking markets, with the United Kingdom and Australia accounting for most of the offshore market. The UK's market share increased from 59.9% in 2015 to 63.2% in 2016, while Australia gained further traction from 22.4% in 2015 to 25.1% in 2016.

There has, however, been a notable decline in the USA's participation in South Africa, from 8.5% of market share to 3.8% in 2016 – probably attributable to the country's changing trade policy, which seeks to slow if not eradicate offshoring - from the US in particular - and outsourcing in general. Because of this – and also because of competition from nearer destinations such as the Philippines and cultural and accent differences - the US will continue to be a difficult market to crack.

Figure 1: Key International Markets serviced by South Africa's BPS sector



Source: BPeSA Key Indicator report 2016

Key Constraints

The growth of South Africa's English market and multi-service offering has placed a strain on available skills supply, demanding a talent pool that offers specialised knowledge, is able to handle complex functions in a rapidly changing sector, and provide strong English language and communication skills.

Key Opportunities

The United Kingdom has proven, however, that excellent work can indeed be done from South Africa; and now providers in South Africa are moving briskly to capture further work from other English-Speaking jurisdictions such as Australia, the US and Canada.

Key Action Programmes

1. Ongoing Implementation of the Monyetla Work Readiness Programme

Nature and Purpose of the intervention

The presence of a large skill pool is one of the location determinants used by investors when deciding where to set up call centre operations. Invariably, all value proposition statements of countries offering BPS include a statement about the local skills base.

In South Africa, efforts have for a long time focused on entry-level skills, through programmes offered by the industry, rebates offered by the SETAs and through the implementation of the Monyetla Work Readiness Programme. In 2016 BPESA participated with the University of the Western Cape (UWC) and private sector stakeholders to introduce a postgraduate diploma in Data Analytics and Business Intelligence, developed by the sector for the Contact Centre Work Force Manager.



Monyetla graduates

Targeted outcomes

The continuation of the Programme will increase the number of agents with specialised skills as well the pool of managers domestically. The next phase will provide a “Monyetla” (an opportunity) to an additional 3,000 unemployed youth from across the country to gain work experience in the BPS industry and other sectors of the economy. About 32 consortia - consisting of employers, training providers and recruiters - have been selected to partner with the state.

Key milestones

2018/19 Q2: 3,000 unemployed youth enrolled.

2018/19 Q4: Training completed.

2018/19 Q4: 70% of the trained youth employed.

Lead departments/agencies: **the dti**

Supporting departments/agencies: BPeSA, National Treasury

Ongoing implementation of the BPS Incentive

Nature and Purpose of the intervention

The BPS incentive is one of the industrial financing support measures provided to the industry to increase South Africa’s participation in the global BPS industry by attracting leading brands from English-speaking markets, with the United Kingdom being the leading market. The incentive reduces operating costs per agent and makes South Africa competitive compared with other host countries.

Targeted outcomes

Creation of approximately 18,000 new jobs by 2019.

Key milestones

2018/19 Q1: 2 Applications approved, 1,000 jobs created and 80% Youth Employment.

- 2018/19 Q2: 3 Applications approved, 1,500 jobs created and 80% Youth Employment.
- 2018/19 Q3: 2 Applications approved, 1,000 jobs created and 80% Youth Employment.
- 2018/19 Q4: 3 Applications approved, 1,500 jobs created and 80% Youth Employment.

Lead departments/agencies: **the dti**

Supporting departments / agencies: National Treasury, EDD

4. Marine Manufacturing & Associated Services



Situational analysis

The industry includes the manufacturing of vessels and the maintenance and repair of ships, boats and rigs. Vessels manufactured locally are used for commercial purposes, transportation and leisure.

Key economic data

Economic Indicator	2015	2016
% Contribution to GDP	0.03%	0.03%
% Contribution to Manufacturing	0.2%	0.2%
Employment	3 900	3 900

Source: Quantec

The South African ship/boatbuilding sector has developed a particular strength in sailing multihull catamarans, with some South African companies seen as global leaders. (There has also been some diversification into power catamaran production). Additionally, some SA companies have developed capacity in niche segments in commercial and public-sector markets - e.g. fire-fighting boats and crew transport boats for the oil and gas sector.

South Africa enjoys a reputation for good quality and customisation, as well as competitive labour costs relative to developed world manufacturers - a significant competitive advantage in labour-intensive processes like hull construction.

A ship-building industry is a bonus for any country, given that it is characterised by high growth potential. This industry has major spin-offs to other industries, including steel, engineering equipment, port infrastructure, trade and shipping services. However, it is clear from looking at some of the ship-building industries internationally that South Africa has a long way to go in developing a sustainable industry all the way down the value chain.

The major challenge South Africa faces is the development of a component manufacturing industry comparable with that of more developed competitor countries. This is important because developing such capabilities would make a significant contribution to employment creation, particularly for the youth.

Though we are still a long way from developing a truly sustainable marine manufacturing industry, **the dti** continues to deepen and strengthens its efforts – particularly on localisation – to help strengthen the industry all the way down the value chain.

Table 1. Principal Components and Services in the Value Chain

Lighting <ul style="list-style-type: none"> • Light Fittings • Lighting System 	Air Conditioning Systems <ul style="list-style-type: none"> • Ventilation Systems • Heating Systems 	Mooring, Deck Machinery, Cargo Systems <ul style="list-style-type: none"> • Anchor, Chains • Winches • Ropes, Fenders, Towing Systems • Cranes, Fork-lifts, RO-RO equipment
Safety, Life Saving & Environmental Protection Systems <ul style="list-style-type: none"> • Life Saving Equipment • Fire Fighting Equipment • MARPOL Equipment • Davits, Cranes, Ramps • Rescue Boats & Lifeboats 	Auxiliary Systems <ul style="list-style-type: none"> • Separators • Pumps and Compressors • Tanks • Valves and Fittings • Heaters and Coolers • Filters, Cleaners 	
Propulsion/Power Generation Systems <ul style="list-style-type: none"> • Diesel Engine • Steam Turbine • Gas Turbine • Gears and Couplings • Propellers • Shafts and Bearings • Main Engine Accessories 	Auxiliary Power Generating System <ul style="list-style-type: none"> • Auxilliary Engines (Diesel) • Auxilliary Boilers 	Accommodation Systems <ul style="list-style-type: none"> • Frames, Walls, Staircases • Doors and Portholes • Sanitation: Fittings and Appliances • Electrical Appliances • Furniture and décor
Electrical Systems <ul style="list-style-type: none"> • Generators • E-Engines • Switchboards • Control Panels • Cables • Power Supply & Batteries 	Instrumentation & Other Systems <ul style="list-style-type: none"> • Control and Alarm Systems • Navigation & measurement Systems • Special Offshore Equipment • Special Underwater Equipment • Special Navy Systems, • Acoustics & Weapon Systems 	General Outfitting Components <ul style="list-style-type: none"> • Stairs, Ladders, Catwalks, Railings, etc. • Glass • Workshop Outfitting

Steering Systems <ul style="list-style-type: none"> • Steering Gear • Rudder • Accessories 	Comms and Audio-Video Systems <ul style="list-style-type: none"> • Communication systems • Data Processing • Audio-Video Systems 	Special Operation Systems for Large Vessels <ul style="list-style-type: none"> • Thrusters • Special Rudders • Roll-Dumping / Anti-Heeling Systems • Active Stabilisers
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Key Constraints

The industry offers an opportunity to expand exports into non-traditional markets driven by industrial and tourism development, particularly in sub-Saharan Africa and the Middle East. It also has a substantial growth opportunity in market extension for commercial boats in sub-Saharan Africa, including for offshore speed craft, ferries, water ambulances, and working boats.

South Africa remains the sub-Saharan destination of choice for training, repair and maintenance operations. This position could be further advanced through greater intergovernmental collaboration with African countries and the facilitation of expanded trade through funding assistance. Attention also needs to be paid to developing better collaboration between the industry and research organisations to realise its considerable potential for innovation.

Key Opportunities

The United Kingdom has proven, however, that excellent work can indeed be done from South Africa; and now providers in South Africa are moving briskly to capture further work from other English-Speaking jurisdictions such as Australia, the US and Canada.

Innovation in the industry is greatly hampered by procuring entities' emphasis on proven design in RFPs. This acts as a brake on the creativity and appetite for risk of local naval designers. Deeper development of local naval design capability would impact powerfully on the value chain, with local components across manufacturing industries supporting innovation in marine manufacturing.

Another hurdle the design industry faces is the cost of accreditation for components to marine standard. This remains very high; and the limited number of vessels manufactured for state entities does not sufficiently incentivise investment in the components industry of marine manufacturing. The effects of designation do trickle down the value chain; but they remain a trickle.

The industry is characterised by an ageing workforce (with an average age of around 55 years) for skilled personnel, who are predominantly white and male. In addition, transformation in the sector is made extremely slow (almost non-existent) by the high cost of industry investment.

Finally, the tariff structure does not incentivise technology transfer or localisation in the assembly processes of systems and engines. For instance, knock-down components for engines or systems attract higher custom duties in import tariff, while fully-assembled engines/systems are generally exempted or carry a very low tariff.

Progress to date

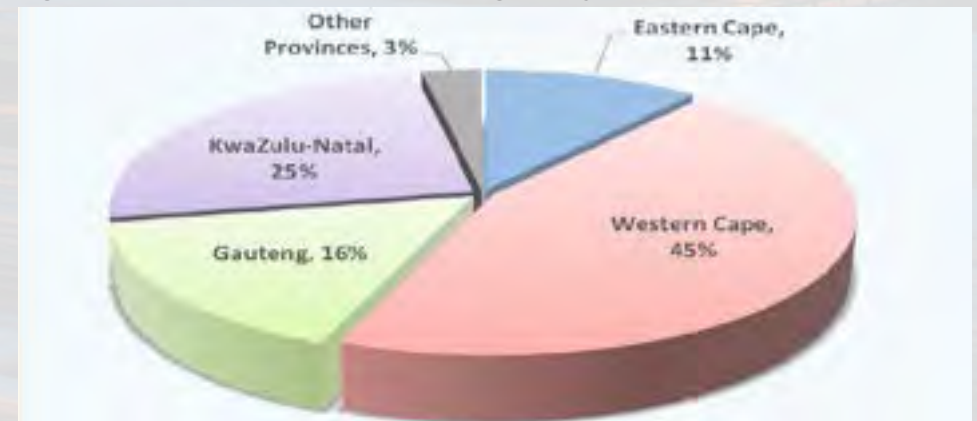
The Industrial Policy unit of **the dti**, in consultation with the industry and key stakeholders, has developed a comprehensive Marine Manufacturing Development Plan (MMDP) to address many of these challenges in the short, medium, and long-term, and start putting the industry on a more competitive footing in the local and global market. Since designation, more-or-less R1.7 billion worth of tenders has been awarded to the local industry. A long-term procurement plan for working vessels has been established and is continuously updated to ensure that the industry is geared for tenders advertised by SOCs and government departments.

In close collaboration between the industry, the CSIR and accreditation bodies, a Supplier Development Programme concept based on standards and accreditation has been developed for the industry.

Similarly, a long-term skills development programme was drafted and completed in consultation with the industry and training institutions. A pilot project was conceived as **the dti's** initiative in collaboration with SAIMI and the Operation Phakisa Skills Working Group. The funding of the pilot project was approved by the National Skills Fund (NSF).

Geographically, most of the ship building activities take place in either Cape Town or Durban. This is illustrated in the figure below.

Figure 1: Provincial marine manufacturing activity share



Source: Urban Econ/MIASA

Table 2: Overall sector economic trade performance

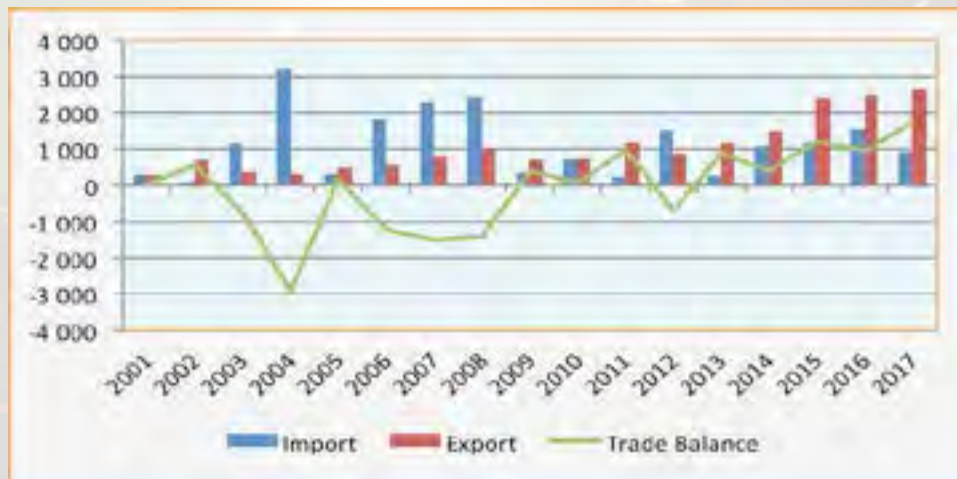
Year	2015	2016
Exports	2 386 940 157	2 499 261 573
Imports	1 187 773 361	1 555 266 706
Trade Balance	1 199 166 796	943 994 867

Source: Quantec

Apart from the financial crisis of 2008, the ship/boat building sector has shown positive export growth prospects, with exports increasing from R2.39 billion in 2015 to R2.5 billion in 2016 (4.71%). However, imports have increased more than (jumping by 30.94% from 2015 to 2016), resulting in a negative trade balance of R943 million. (Though this showed a decrease of 21.28% from the 2015 level).

In 2016, the biggest contributors to South African exports and imports were sailboats (at R1,078,486,348) and dredgers (at R894,785,095).

Figure 2: South African Trade of ships, boats and floating structures (R billion)



Source: dti calculation based on SARS Data

Key Action Programmes

1. Components Supplier Development Programme

Nature and purpose of the intervention

Between 1994 and 2014, a total of R19 billion was spent on the acquisition of vessels for the public sector. Of these acquisitions, only R900 million was allocated to the procurement of locally manufactured vessels and the rest (or 95%) of these vessels were imported. Vessel lifespan varies between 25 and 30 years, and if imported it becomes a missed opportunity for the manufacturing and the maintenance of the vessel locally. The multiplier effects along the value chain get lost as well; in particular, employment creation and the opportunity to hone our industrial capabilities. The marine manufacturing industry offers significant opportunities along its value chain through demand for components in the manufacturing process of vessels and in the maintenance and repair space.

Domestic supply of components is extremely weak and, in the case of many components, non-existent. This programme aims to encourage large private sector enterprises to partner with government to support, nurture and develop SMEs within the partner's supply chain or sector, so as to become manufacturers of goods and suppliers of services in a sustainable manner. The aim is to resuscitate the marine manufacturing industry and its entire value chain, increasing domestic demand and rebuilding domestic capabilities, including in maintenance, repair and overhaul (MRO).

Targeted outcomes

Developed supply chain capabilities and capacity in support of the core builders and a locally and globally competitive components manufacturing sector.

Key milestones

2018/19 Q1 – Q4: Develop a component supplier development programme and support mechanism for accreditation and certification for component manufacturers, working closely with the core builders and the Technology Localisation Implementation Unit (TLIU) at CSIR.

Lead department/agencies: **the dti**

Supporting department/agencies: EDD, SABS, Lloyds, Bureau VERITAS, SAMSA, SAIMI, eThekweni Maritime Cluster, Industry, DHET, DST, CSIR, NT

2. Skills Development Programme: competitiveness improvement initiative with focus on skills

Nature and purpose of the intervention

The South African marine manufacturing industry is faced not only with a shortage of highly-skilled people and an ageing workforce which needs urgent rejuvenation, but also with a shortage in the lower-level skills levels needed to support its local and global competitiveness. The importance of this industry remains closely linked to its labour-intensive characteristic, and its high employment multipliers.

To respond to the skills shortage in the industry, Operation Phakisa, based on the Malaysian “Big Fast Results” model, established a Marine Manufacturing Skills Working Group (SWG) and mandated **the dti** to embark on a process of establishing a road map for skills development for the growth of the industry.

In line with this mandate that **the dti** proposed to the SWG the establishment of a pilot project to test the suggested skills development programme. The Skills Pilot Project will be run as a collaboration between **the dti**, SAIMI (fund administrator) and training institutions, and is expected to be launched early 2018. The programme is industry-based, with a strong focus on artisan training and intensive work experience exposure. NSF funding for the Pilot Project has been secured.

Targeted outcomes

A large pool of skilled workers, thus expanding the knowledge base and improving the competitiveness of the industry.

Key milestones

2018/19 Q1 – Q4: Implementation of Skills Development Programme (pilot project), a competitiveness improvement initiative with a focus on skills.

Lead department/agencies: **the dti**, DHET

Supporting department/agencies: EDD, SAMSA, SAIMI, eThekweni Maritime Cluster, Industry, DST, NT

5. Aerospace and Defence



Situational Analysis

The South African Aerospace and Defence industry is a globally competitive industry which supports national interests and is striving to be a preferred choice for aerospace and defence-related solutions on the African continent. The industry is successfully integrated into South Africa’s wider industrial landscape. It has helped to expand the national science, engineering and technology base and has supported the technical and technological skills base. In addition, it has successfully entered the global market through its exports to and global partnerships with many of the world’s leading aerospace and defence OEMs and Tier-1 /Tier-2 companies.

Key economic data

Economic Indicator	2016
% Contribution to GDP	0.1%
% Contribution to Manufacturing	1.6%
Employment	15,000

Source: Quantec

Since the early 1990s, the industry has been dramatically re-shaped by the political changes driven by the transition from apartheid to democracy. It does, however, remain largely dependent on a single customer, the SA government. Because of this, while it continues to develop technologies for both civil and defence use, much more limited funding for research and development and a shrinking local acquisition budget have contributed to a decline in the industry's (previous bloated) predominance.

In 1990, the industry had 130,000 employees in 3,000 companies (9% of manufacturing employment and 10% of manufacturing companies); currently it employs 15,000 people across some 120 companies.

Defence Force acquisition dropped from R26.2 billion in 1989/90 to R6 billion in 2016; Research and Development funding declined from R 6.1 billion in 1989/90 to R 850 million in 2017, and turnover from R 31.6 billion in 1989/90 to R 19 billion in 2016.

Fig 1. Defence Acquisitions and Contribution to GDP



Source: National Defence Council

These funding challenges have forced the industry to seek business in related industries for survival. The defence industry has achieved effective development and production by sharing facilities and personnel with the civilian sector, based on advanced civilian technologies.

Fig.2 below indicates estimated turnover from non-scheduled aviation services amounting to R23.3 billion.

Fig 2. Estimated value chain of Commercial Non-Scheduled Aviation Services: 2016



Source: CAASA

Within the new context, however, it has been able to retain a leading position in some fields of R&D and product development, including aerostructures, tactical communications, radar, electronic warfare, artillery, mortar ammunition and precision weapons.

In 2016 the NCACC authorised export permits to the value of more than R4 billion to more than 80 countries. The contracts surpassed the previous year by more than 45%, resulting in an increased contribution to the South African Trade balance of R3.5 billion, as indicated in the table below.

Table 1. Authorised Defence Contracts

	2014	2015	2016
Imports Authorised (R`000 000)	200	502	673
Exports Authorised (R`000 000)	2,997	2,739	4,170
Contribution to Balance of payments (R`000 000)	2,777	2,237	3,497

Source: NCACC

The industry continues to increase its market share in Africa, Asia and Europe in products such as land systems, weapons and ammunitions, fire control and related warning equipment and other electronic equipment, including rangefinders and communication equipment. Countries such as Egypt, Germany, Italy, Malaysia and the United Arab Emirates have recently added South African counter-measures equipment to their inventories such as periscopes, binoculars, ruggedised computers and observation and targeting systems.

Key Constraints

- The major constraint is the absence of a coherent national defence procurement strategy and plan in which government departments (**the dti**, DPE, DST, DoE and DMR); organs of state (IDC, CSIR and defence testing centres); and National Champions (Denel and Armscor) should be participants.
- Limited government support - political and diplomatic, industrial and financial. The complexity of the industry has led to funding institutions such as the Industrial Development Corporation being unwilling to finance it.
- Sales of arms at friendship prices; dumping equipment; and even donations of arms as a means of buying influence in Africa and other developing nations.

Risks/threats

- Continued underfunding of the Defence Force, which restricts its ability to acquire new equipment and systems and its ability to support new research and development. While several companies have done well in the export market, much future potential will be lost if the industry does not have new products with which to compete.

- Slow and erratic export controls which can discourage repeat orders and even deter potential clients.

Key Opportunities

- Development and production of equipment suited to national geographical characteristics for the domestic, African continental and international markets.
- Positioning the local industry as a one-stop shop for defence solutions for the African continent and as a preferred African partner. In the international markets, the appearance should be that of the desired Team South Africa Inc.
- Maintenance, refurbishment and overhaul of aerospace and defence products.
- Development of the National Flagship project, the Small African Regional Aircraft.

Progress Highlights

1. In support of providing an equitable and competitive environment the following results have been achieved:
 - Development of a Defence Strategy to retain, sustain and develop sovereign defence capabilities for both local and foreign markets, under the umbrella of the defence council.
 - Formation and funding of an Export Council, whose aim is to identify and diversify into new and emerging markets. To date, exports represent more than 60% of the industry's revenue.
 - Development of the defence industry-specific BBBEE Charter, which takes account of the historical background of the industry, under the auspices of the National Defence Council.
 - Inclusion of the industry in **dti** Incentives.
2. Aerospace Industry Support Initiative (AISI).

The AISI, a **dti** initiative hosted by the CSIR and guided by **dti** strategic objectives, has undertaken 126 projects between 2012/13-2016/17. During the same period, a total of 65 highly-skilled jobs were created or retained. Training in industry scarce skills also happened during the same period. This information is summarised in Table 2.

Table 2: AISI Highlights 2012/13 - 2016/17

Years	Industry Scarce Skills Developed	Numbers of Highly Skilled Jobs Created or Retained	Number of SMMEs Benefitted
2012/13	2	20	16
2013/14	3	17	49
2014/15	12	5	26
2015/16	8	10	28
2016/17	10	13	15
Grand Total	35	65	134

Table 3: Key Projects High-Level Summary 2012/13 - 2016/17

Project Name	Support Received	Outcomes
Programme: Supplier Development		
Avionic component local design and manufacture	Design and manufacture of a transponder mounting tray that meets all industry specification	<ul style="list-style-type: none"> 3 SMMEs benefitted Import substitution – transponder mounting tray Collaboration between Daliff and Tellumat (SMME and OEM)
SatAuth Technology Demonstrator	To provide the most cost-effective solution for real-time acquisition of debit and credit card transactions during flight	<ul style="list-style-type: none"> 17 SMMEs involved Local capability with potential for extension in whole aviation industry. Scarce skills developed: Quality assurance of the SatAuth Server
Nano-satellite imager development	Design, development, assembly and testing of a low-cost space imager customised for nano-sat missions	<ul style="list-style-type: none"> 2 SMMEs involved Export capability: Gecko Imager 8 jobs were created or retained

Process design and validation of CFRTP overlap joining methods	Design, industrialisation and validation of continuous fibre reinforced thermo-formed plastic (CFRTP)	<ul style="list-style-type: none"> 2 highly skilled jobs retained Retention of international contract to manufacture lower connecting units 9 scarce skills developed
Programme: Industry Development and Technology Support		
SKA PC boards localisation (TraX interconnect)	Upgrading and enhancing TraX's printed circuit boards capabilities in support of the SKA's localisation strategy.	<ul style="list-style-type: none"> 10 highly skilled jobs created Import substitution 1 SMME involved
Stellar gyro project	Design and development of a stellar gyroscope subsystem suitable for low-cost small and nano-satellite application	<ul style="list-style-type: none"> 2 SMMEs involved 1 highly skilled job created 1 export capability created

Source: Quantec

Denel Aerostructures and Aerosud Aviation

Denel Aerostructures and Aerosud Aviation are the two OEMs that the AISI mainly collaborated with for purposes of technology transfer and technology-based supplier development of SMMEs in the industry. Table 3 shows the number of SMMEs that were supported by the organisations.

Table 3: Denel Aerostructures and Aerosud aviation highlights 2012/13 - 2016/17

Organisations	Number of SMMEs benefitted	Number of Projects Supported	New Technology/ Advancement of Existing Technology
Aerosud Aviation	6	11	8
Denel	7	11	8
Grand Total	13	22	16

Source: the dti

Centurion Aerospace Village

The CAV, an initiative of **the dti** and a cluster development programme for the Aerospace and Defence industry, has commenced with the erection of the electrical cable for external bulk services, after conclusion of service level agreements with the City of Tshwane. These agreements pave the way for accelerated infrastructure development: roads, water and electricity.

The CAV has already housed its first Tenant, the AHRLAC. This is a light reconnaissance and counter-insurgency aircraft developed locally by AHRLAC Holdings, a joint venture between the Paramount Group and Aerosud. It is designed to perform as an inexpensive, more versatile substitute for unmanned aerial vehicles (UAVs) and modern light attack aircraft.

The Joint Aerospace Steering Committee (JASC)

Aerospace has been identified by government as a sector with the potential to develop long-term advanced manufacturing capabilities. This has now resulted in the formulation of an Aerospace Sector Development Plan (ASDP). In terms of the plan, the central co-ordination of activities within the aerospace sector is of national benefit; and this in turn led to the establishment of the Joint Aerospace Steering Committee (JASC).

The JASC has selected and approved the Small African Regional Aircraft (SARA) project as National Flagship. SARA is a programme for the design, development, industrialisation and manufacturing of a pressurised 24-seat turboprop with passenger/cargo/combi configurations for point-to-point commuter travel between decentralised economies. It is intended to meet 21st century transportation system needs for Africa and similar regions including the Middle-East, Indonesia, Malaysia and South America.

Key Action Programmes

1. Conclusion of the Commercial Aerospace Framework

Nature and Purpose of intervention

To develop and support the growth of the South African aerospace industry so as to position it to supply products and services to international markets and grasp opportunities offered

by the Digital Industrial Revolution, it is important to develop a framework that identifies both the South African aerospace industry's capabilities and weaknesses and identifies opportunities that exist in both the domestic and international markets. This will then provide the basis to develop a strategy to capitalise on those opportunities and support the industry to strengthen the areas that can enable it to grow its share of these markets.

Targeted outcomes

- Increased contribution of the industry to GDP and employment;
- Increased exports of manufactured goods and services;
- Better developed domestic capabilities.

Key milestones

2018/2019 Q1: Approval of the funding model.

2018/2019 Q3: Conclusion of the Aerospace Industry development framework.

2018/2019 Q4: Approval of the Key Action Programmes.

Leading Departments/Agencies: **the dti**, CSIR, AISI

Supporting Departments/Agencies: DST, DoT, DPE, National Treasury, CAV, IDC, Industry Associations

2. Finalising and implementing the Radar Systems Localisation Strategy

Nature and Purpose of the intervention

With its long coastlines and inland borders, South Africa (under UN-mandated legislation), is heavily reliant on technologies that can provide the necessary surveillance over these vast areas. Radar is one such technology which, unlike many others, has a well-established base in South African industry and must be further nurtured if the state is to obtain full benefit from this domestic capability.

Currently, the scoping of industry capabilities and collection of procurement data has been completed. An analysis now needs to be done to match technology funding and historical local acquisitions in different classes to future requirements and then identify gaps in technology funding to meet future requirements.

Targeted outcomes

Strengthened and deepened localisation of radar systems, with an improved local supplier base and skills.

Key milestones

2018/19 – Q2: Conclusion of localisation strategy.

2018/19 – Q3: Signing off the interdepartmental agreement.

2018/19 – Q4: Implementation of the interdepartmental agreement.

Leading Departments/Agencies: **the dti**, DoD, CSIR and AISI

Supporting Departments/Agencies: DST, ARMSCOR, Industry Associations

3. Development of aerospace and defence market intelligence tool

Nature and Purpose of the intervention

The South African aerospace and defence industry is dependent on its capabilities to implement solutions that provide tailor-made equipment, components, parts and services for a unique environment. But the size of the SA defence budget has remained largely stagnant and with increasing personnel and operational costs, the capital acquisition budget has been systematically reduced. These factors are resulting in consistent decline of the revenues accruable to the SADI, making it necessary for it to depend on exports to function as profitable businesses, be competitive and preserve national strategic capabilities.

To strengthen its export capabilities, the industry needs a query-based interactive online platform that will track aerospace and defence trends on a country, African and global level and provide intelligence on economic and industry data, with quarterly projections for select variables. The platform should enable users to select desired countries and indicators and easily access customised reports.

Targeted outcomes

- Improved enabling export environment.
- Improved export growth and new market penetration.

Key milestones

2018/2019 Q2: Secure Agreements on the concept with the Industry Association and relevant stakeholders.

2018/2019 Q3: Industry profiling.

2018/2019 Q4: Roadmap of the platform and agreement with relevant stakeholders.

Leading Departments/ Agencies: **the dti**, DoD, ARMSCOR, AISI, AMD

Supporting Departments/Agencies: DST, CSIR

4. Establishment of Bilateral Air Safety Agreements (BASA)

Nature and purpose of the intervention

Several South African companies manufacture products and offer services to the international aerospace market, most notably the European Union and the United States. South African manufactured products are required to have Federal Aviation Authority (FAA, USA) and European Aviation Safety Authority (EASA, EU) certification. This is costly, and most companies are unable to afford the outlay required to get the necessary approvals for exporting their products into the US and EU market.

Targeted outcomes

- A more competitive environment for the aerospace industry.
- Deeper integration into global supply chains.

Key milestones

2018/2019: Q1-Q2: Facilitate engagements with the USA on the review of the existing BASA to enable trade in aeronautical products.

Lead departments/agencies: **the dti**, Department of Transport, South African Civil Aviation Authority

Supporting Departments/Agencies: CAASA

5. Development of the Aerospace National Flagship

Nature and purpose of the intervention

ASDP proposes National Flagship programmes as instruments to advance the aerospace sector and reinforce industrial growth objectives in a meaningful way.

In line with the above, the SARA project was approved by the JASC as a National Flagship. The project meets a set of selection criteria, which include: industrial growth stimulus, industry integration potential, R&D and economically viable human capital development opportunities. The economic viability study was conducted by Lufthansa Consulting Group and co-funded by **the dti**, DPE, IDC, and Denel.

The market potential identified in the Lufthansa Consulting report identified the following outcomes:

- Human Capital Development including high-tech engineering jobs;
- Sales and export revenue;
- Enterprise development;
- Technology spillover and economic multiplier effects to other industry sectors, given the high-tech base of aerospace;
- Wide-ranging air transport sector benefits (CAA bilateral with FAA/EASA, tourism, pilot & crew training, air freight services etc.).

Targeted outcomes

- Creation of high-skilled employment;
- Enhanced industrialisation in the aerospace industry and its supporting industries;
- Strengthened localisation and exports.

Key milestones

2018/2019 Q3: Validation of the current body of knowledge including the current technical concept, the maturity of concept and other relevant technical work.

2018/2019 Q4: Conclusion of a benefit study of the Preliminary Design Review Phase and identification of potential sources of funding for the remainder of the programme.

Leading Departments/ Agencies: JASC, DPE, DST, **the dti**, DoT, IDC, AISI, CAASA
Supporting Departments/Agencies: CSIR, Denel, Industry Associations

6. Enabling high-value manufacturing through technology enhancement for the aerospace industry

Nature and Purpose of the intervention

A look at the local aerospace industry highlights that very few companies are proactively ramping up their existing manufacturing capabilities to be able to leverage new technologies for mainstream applications as these systems improve in functionality and as materials science matures.

Several technologies have been identified by the local industry as key to the future sustainability of the sector in South Africa. These include: additive manufacturing; automation in composites; digital manufacturing; and surface treatment technologies.

These technologies have the potential to increase the efficiency and 'speed to market' of the local aerospace industry if applied correctly. In addition, they can also result in huge cost savings for aerospace manufacturers. Some of the technologies also offer a competitive advantage through reductions in weight, material cost and manufacturing time. These benefits are critical for local aerospace manufacturers to compete in the global industry.

Targeted outcomes

- Improved competitiveness of aerospace Tier-1 suppliers and SMMEs, enabling them to increasingly integrate into international supply chains and compete globally.
- A more transformed and diversified industry.

Key milestones

2018/2019 Q1: Define the scope of support and sign agreements with participating companies.

- 2018/2019 Q3: Implement projects providing access to technology and expertise.
- 2018/2019 Q4: Review and evaluate impact within the aerospace industry, focussing on aerospace SMME growth, competitiveness and economic impact.

Leading Departments/Agencies: CSIR, **the dti**, DST

Supporting Departments/Agencies: EDD, DoD, Academic Institutions.

7. Establishment of the manufacturing cluster and sub-tier development park

Nature and purpose of the intervention

The South African defence and aerospace industries have continued to grow revenue, primarily in export markets. To maintain and expand these export markets, there is a need to immediately stimulate the industry's growth potential by establishing an Industrial Development Park.

The cluster should provide an enabling infrastructure for aero-mechanical, advanced manufacturing, maintenance, repairs and overhaul (MRO) capabilities – both for the initial anchor tenants and, subsequently, for a range of large to small enterprises in the aerospace, defence and advanced manufacturing sectors. This will include OEM suppliers of components, parts and tools, as well as associated service providers and relevant industries (tooling) and sectors (electro-technical, metals, chemicals, etc.)

Targeted outcomes

- Integration of sub-tier suppliers of the local industry into the global supply chain by bringing aerospace and defence industry suppliers into proximity with one another and locating them next to major system integrators and anchor partners.
- Promotion of local innovation, new business and exports in the aerospace and defence sectors.
- Provision of opportunities for incubation and entry-level manufacturing through skills development.

Key milestones

- 2018/19 Q4: Completion of the prioritised minimum bulk earthworks and Infrastructure, core CAV landside bulk utility services and infrastructure (water and sanitation, roads and storm-water drainage, electricity and land management - all to comply with township conditions of establishment.
- 2018/19 Q4: Receipt of Occupational Certification.
- 2018/19 Q4: Conclusion of the marketing campaign and signing of Pre-Lease Agreements with 2 prospective tenants/industry investors.

Lead departments/Agencies: **the dti**, CAV

Supporting departments/Agencies: DPW, EDD, DPE, DoD, DST, GPG, CoT

6. Electro-technical Industries



Situational analysis

The South African electro-technical sector is largely dependent on imported content - for example, electronic components and specialised devices such as medical and telecommunications equipment etc. These are overwhelmingly imported from China (and to a lesser extent, Vietnam, the USA and the EU) – see Figure 1 below.

This import dependency is not unique to South Africa, since the global electro-technical sector is dominated by only a few countries, with long-established very large companies.

Even though the sector is dominated by a few players generally and South Africa has lost a lot of its design and production capabilities, the country continues to attract and maintain investments in certain areas of production.

There is both a need, and a real possibility, to localise production of inputs where local capacity and capability exists. The obvious initial avenue to follow is the establishment of mutually beneficial working relationships with the OEMs operating in the country.

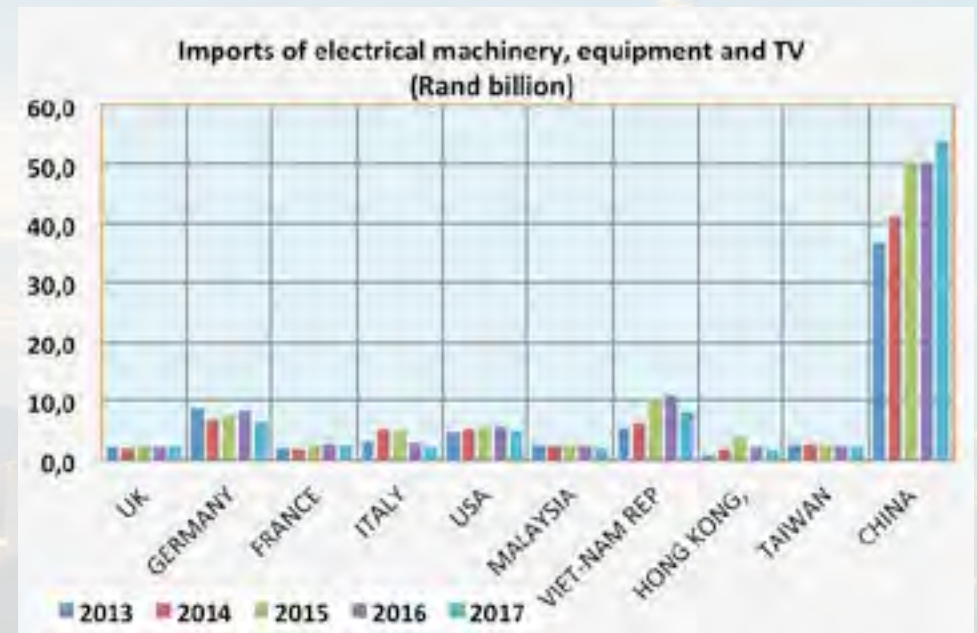
Localisation and skills development will continue to be essential, both for growing the domestic industry and with an eye to potentially highly lucrative export markets across the African continent.

Key Economic Data

Variable	Contribution in 2016
Contribution to GDP	R363.2 bn
Employment	318 000
Exports	R27.05 bn
Imports	R119.7 bn
Trade deficit	R92.65 bn

Source: dti 2016 Electro Technical CSP review

Figure 1. Annual Imports of HS85: electrical machinery and equipment & parts thereof; sound recorders and reproducers; television etc. 2013-2017



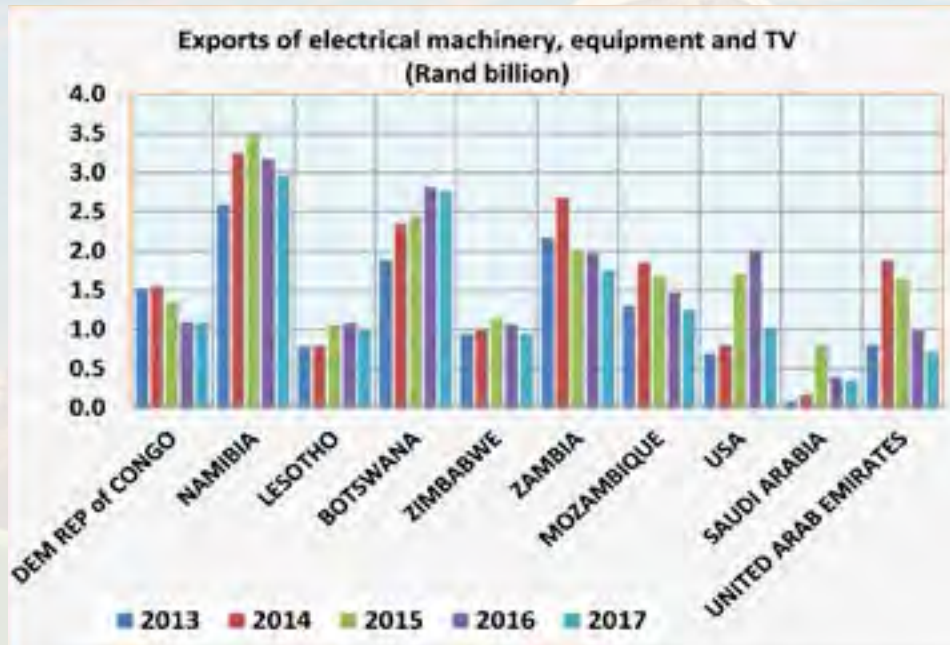
Source: the dti 2016 Electro Technical CSP review

The electronics sub-sector as a whole is doing well in terms of exports, accounting for 54% of total electro-technical exports in 2014. Consumer electronics exports, however, lag behind, accounting for just 8.5% of total exports.

The industry sub-sector that has shown the largest capabilities and strongest growth is electrical machinery and apparatus – typically including consumer electronics, electricity transmission and distribution equipment and broadcasting equipment.

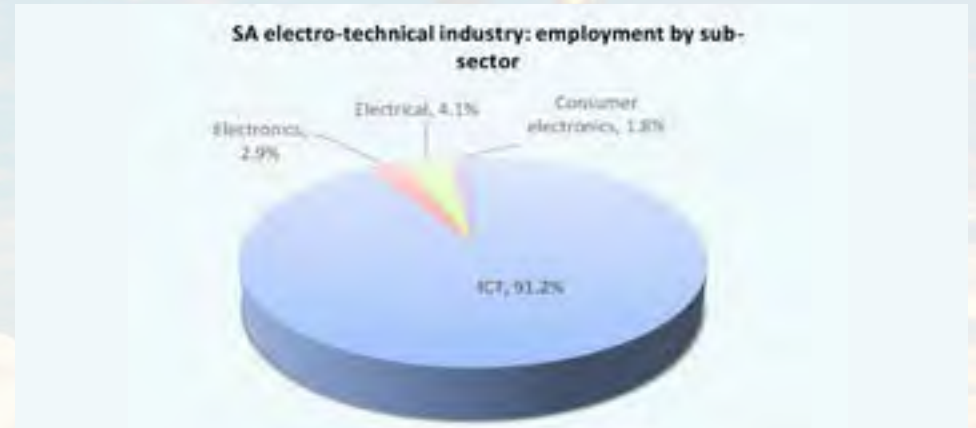
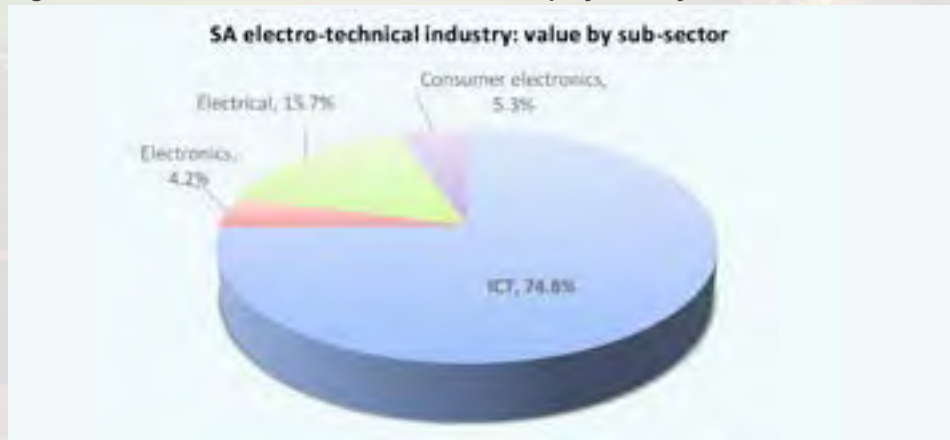
More than half of total exports go to SADC - the top three export destinations being Namibia, Botswana and Zambia.

Figure 2. Annual Exports of HS85: electrical machinery and equipment & parts thereof; sound recorders and reproducers; television etc. 2013-2017



Source: the dti 2016 Electro-Technical CSP Review

Figure 3. Relative value and contribution to employment by each sub-sector



Source: the dti 2016 Electro-Technical CSP review

Figure 4. Employment: Q1 2016 to Q1 2017

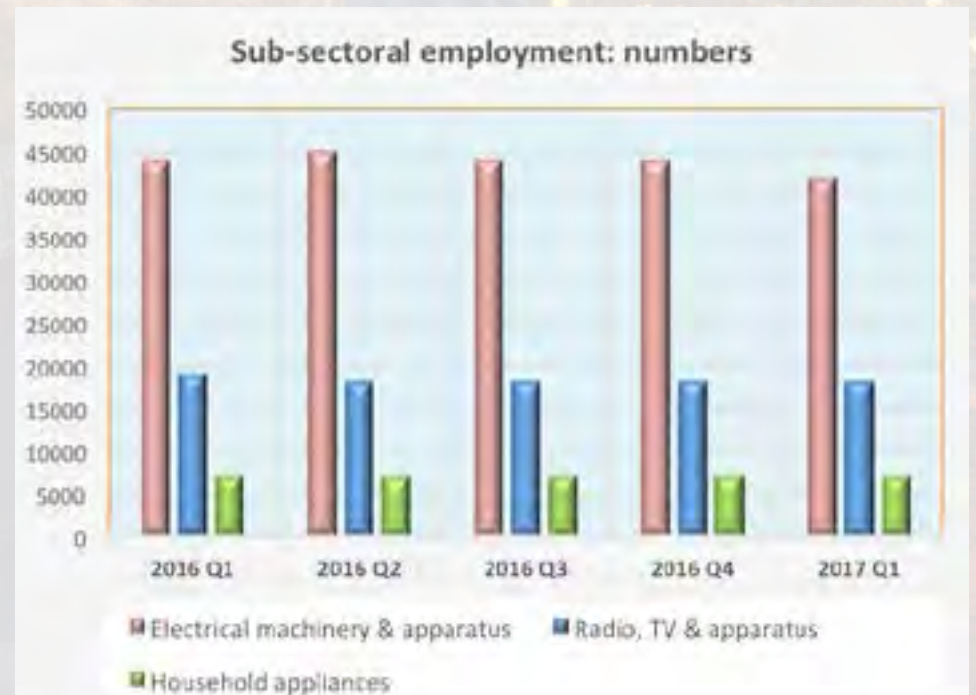


Figure 4 above shows a relatively stable employment picture for the five quarters depicted. Electrical Machinery was the only sub-sector that created new jobs during the period (760 in 2016 Q2). Though these numbers fell back again in subsequent quarters, the relatively much higher level of employment for this category is probably best explained by the fact that the manufacturing of items like switchgears is labour-intensive in comparison to products (radio, TV, household appliances) which have predominantly electronic production processes.

There is increasing convergence in technology in products such as smart TVs, which are now able to perform functions that a typical computer would; hence, the classification becomes somewhat blurred.

Key Constraints

- Due to its complex sub-sectoral dynamics, the industry has struggled to consolidate and create a meaningful industry body that would allow for easy engagement with government. This results in difficulty in consulting for new policy initiatives and difficulty in aggregating data.
- Local cost of production for most electro-technical products renders the domestic market uncompetitive against cheap imports.

Key Opportunities

- Opportunities for suppliers of components into the automotive value chain
- Investment into the rest of the African continent. The conclusion of the Tripartite Free Trade Agreement will open up further markets in the Eastern, Western, Northern and Central regions of the continent.
- The growth of the LED Lighting market will present an opportunity for localisation.
- Increased interest in further investments in HV cable manufacturing arising from the designation of cables.

Key Action Programmes

1. Local Procurement of High Voltage Switch Gear

Nature and Purpose of the intervention

South Africa has developed manufacturing capability in high voltage switchgear and is globally competitive in this sub-sector, covering all 3 main areas of applications - low, medium and high voltage. There has, however, been an increase of imported products in recent years, which is a concern that needs to be addressed

The largest procurers of these items are largely SOCs, with an estimated local content of above 60%. This positions high voltage switchgears well for possible designation and support. Even though there are other procurers such as mining houses, the main consumer will likely continue to be government.

From preliminary research, the sector is estimated to be employing just over 3,000 people directly in production, with downstream employment - in the areas of maintenance, installation and support – standing at around 5,000. These are labour-intensive activities and make a direct contribution to other industries such as steel, copper, electronics and electrical products.

The intervention seeks to ensure that the state, as the primary buyer, procures locally-produced HV switchgears. This is also aimed at promoting direct investments in the assembly and manufacture of components to supply both South Africa and the regional market.

Targeted outcomes

- Import replacement: currently, these items are largely imported and only 1 manufacturer and 1 assembler (using imported components) currently exist in the market.
- Increased exports and a sustainable market for local assemblers and contract manufacturers to supply government. This will ultimately increase value-addition to locally produced devices.

Key milestones

2018/19 Q2: Industry analysis report completed.

2018/19 Q4: Localisation report completed.

Lead departments/agencies: **the dti**

Supporting departments / agencies: National Treasury, Eskom and Municipalities

2. Localisation of LED Lighting

Nature and Purpose of the intervention

The Light Emitting Diode (LED) sector is one of the fastest growing industries in the world. According to the latest imports statistics provided by SARS, the country averaged imports between R500 million and R600 million between 2014 and 2016; and this is continuing to increase. The local market is dominated by importers who provide these items to local designers and installers. There has also been an evident price decrease in these items as demand has increased.

From a policy perspective, South Africa is driving energy efficiency programs - as seen for example in the implementation of appliance labelling for fridges - to encourage efficient use of energy. LEDs provide savings, longer product life and can be seen a part of 'next step' technological evolution.

Municipalities are now moving into LED street lights, industrial lighting applications, office lighting and so forth. The backbone of these devices lies in electronics manufacturing, in which the country has capacity. As an addition to local capability, the LED lighting industry is well set up for localisation initiatives which can drive the transformation and development of this industry into a fully-fledged manufacturing sector.

The Department of Public Works' mandate is to be the custodian and manager of all national government fixed assets. A number of the products it procures are from the electro-technical industry - including LED lighting, air conditioning, fire and smoke detection, lifts and generators.

LED lighting has been selected for possible localisation, given that:

- The DPW and municipalities procure large volumes of these items for various applications - e.g. buildings and street lighting;

- Expected increase in public spending on LEDs due to increased affordability;
- Adequate electronics manufacturing and assembly capacity exists to sustain local demand for the population of the PCBs required for lighting control of LEDs;
- There is growing global demand for LED products, covering a wide range of industries such as automotives, household appliances and others.

Targeted outcomes

A competitive local LED production sector. This will in turn contribute to local manufacturing and design, drive exports and serve as leverage to attract leading global manufacturers into the sector on the back of state procurement.

Key milestones

2018/19 Q2: Industry analysis report completed.

2018/19 Q4: Localisation report completed.

Lead departments/agencies: **the dti**

Supporting departments / agencies: Eskom, NT, Department of Public Works, Municipalities, and SOCs

3. Roll-out of the White Goods Industry Cluster

Nature and Purpose of the intervention

During the 2017/18 financial year **the dti**, in partnership with the South African Electro-Technical Export Council, worked in collaboration with the White Goods Manufacturers Forum to identify suppliers on a one-to-one basis to improve the latter's performance for the benefit of buying organisations.

The aim is to achieve significant improvements in total added value for both suppliers and buyers in terms of B-BBEE rating, product or service offering, business processes and improvements in lead times and delivery.

The intervention includes a strategy for building SMMEs to allow them to enter competitive markets and participate in the export value chain.

The purpose of the Cluster is to provide support to emerging component manufacturers through monetary and non-monetary contributions, by both the industry and **the dti**.

Targeted outcomes

Greater facilitation, coordination and supplier competitiveness in the South African White Goods industry.

Key milestones

2018/19 Q2: Analysis of the complete range of White Goods products per HS code manufactured and/or assembled in South Africa completed.

2018/19 Q4: Supplier Accreditation by OEMs commences.

Lead departments/agencies: **the dti**





Supporting departments / agencies: South African Electrotechnical Export Council, SALGA, OEMs





the dti **KEY PARTNERS AND
TECHNICAL SUPPORT INSTITUTIONS**

KEY PARTNER INSTITUTIONS

 <p>Industrial Development Corporation (IDC)</p>	<p>Contact Mr Geoffrey Qhena, CEO Head office: +27 11 269 3000 Call Centre: +27 860 693 888 Email: geoffreyq@idc.co.za Web: www.idc.co.za</p>
<p>The IDC is a national development finance institution. Its core function is to provide industrial financing support, much of which flows to key Industrial Policy Action Plan (IPAP) and/or New Growth Path (NGP) sectors.</p>	
 <p>National Empowerment Fund (NEF)</p>	<p>Contact Mrs Philisiwe Mthethwa, CEO Head Office: +27 11 305 8000 Email: Mthethwap@necorp.co.za Web: www.necorp.co.za</p>
<p>The NEF's role is to support broad-based black economic empowerment. It focuses on preferential procurement, broadening the reach of equity ownership, transformation of staffing and management, and prevents the dilution of black shareholding</p>	
 <p>Competition Commission South Africa</p>	<p>Contact Mr Thembinkosi Bonakele, CEO Head Office: + 27 12 394 3200 Email: Thembinkosib@compcom.co.za Web: www.compcom.co.za</p>
<p>Investigates, controls and evaluates restrictive business practices, abuse of dominant positions and mergers.</p>	
 <p>Export Credit Insurance Corporation of South Africa</p>	<p>Contact Mr Kutoane Kutoane, CEO Head Office: + 27 12 471 3800 Email: kutoane.kutoane@ecic.co.za Web: www.ecic.co.za</p>
<p>Provides insurance cover on risks associated with investments and loan finance for capital goods and services projects in foreign countries.</p>	



Council for Scientific and Industrial Research (CSIR)

Undertakes and supports research across diverse areas of science and technological innovation to enhance industrial and scientific development.

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Technology Localisation Implementation Unit (TLIU)

The TLIU is an initiative of the Department of Science and Technology, which is hosted and incubated at the CSIR. It was established by the department to implement the deliverables of its Technology Localisation Plan.

Contact

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Technology Innovation Agency (TIA)

The TIA was formed through merging seven DST entities previously tasked with supporting and promoting innovation in the country. The TIA's mandate is to enable and support technological innovation across all sectors of the economy to achieve socio-economic benefits for South Africa and enhance its global competitiveness.

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International Trade Administration Commission (ITAC)

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TECHNICAL SUPPORT INSTITUTIONS



National Metrology Institute of South Africa (NMISA)

Oversees and controls the use of measurements units of the International System of Units to maintain primary scientific standards of physical quantities in South Africa.

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The National Regulator for Compulsory Specifications (NRCS)

Protects human health and safety and the environment: Develops, administers and enforces compulsory minimum specifications for the safety and performance of products and services; supports fair trade practices.

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The South African Bureau of Standards (SABS)

Develops, promotes and maintains SA National Standards of quality in commodities, products and services; provides conformity assessment services (testing and certifications).

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South African National Accreditation System (SANAS)

Provides formal recognition of the competency of laboratories, certification and inspection bodies, proficiency testing scheme providers and good laboratory practice (GLP) test facilities.

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Companies and Intellectual Property Commission

Registration of Companies, Co-operatives and Intellectual Property Rights (Trade Marks, Patents, Designs and Copyright) in South Africa.

Contact

Tel: 086 100 2472

Fax: 086 517 7224

Website: www.cipc.co.za



The National Consumer Commission (NCC)

The primary regulator of consumer-business interaction in South Africa, created by government under the auspices of the Department of Trade and Industry (**the dti**) to ensure economic welfare of consumers. Consumers play a vital role in the growth of the economy and thus contribute to the national fiscus and the development of the country.

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Head of Enforcement: Ms Prudence Moilwa

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E-mail: P.Moilwa@thencc.org.za

Web: <http://www.thencc.org.za>



Water Research Commission

Supporting sustainable development through research funding, knowledge creation and dissemination.

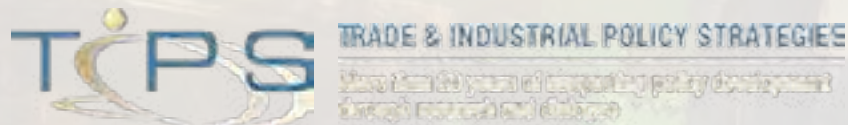
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Department:
Trade and Industry
REPUBLIC OF SOUTH AFRICA

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