

INDUSTRIAL POLICY ACTION PLAN

2017/18 - 2019/20

Economic sectors, employment and
infrastructure development cluster

PART 2: THE ENGINE ROOM OF CHANGE

- * In-depth economic analysis: global and domestic
- * Sector reports
- * Case studies: successful public-private sector cooperation
- * Key action programmes, 2017-2020

Smart industrialisation | Innovation | Value addition | Exports |
Empowerment | Social inclusion | Sustainable jobs

Industrial policy in a turbulent world



the dti

Department:
Trade and Industry
REPUBLIC OF SOUTH AFRICA

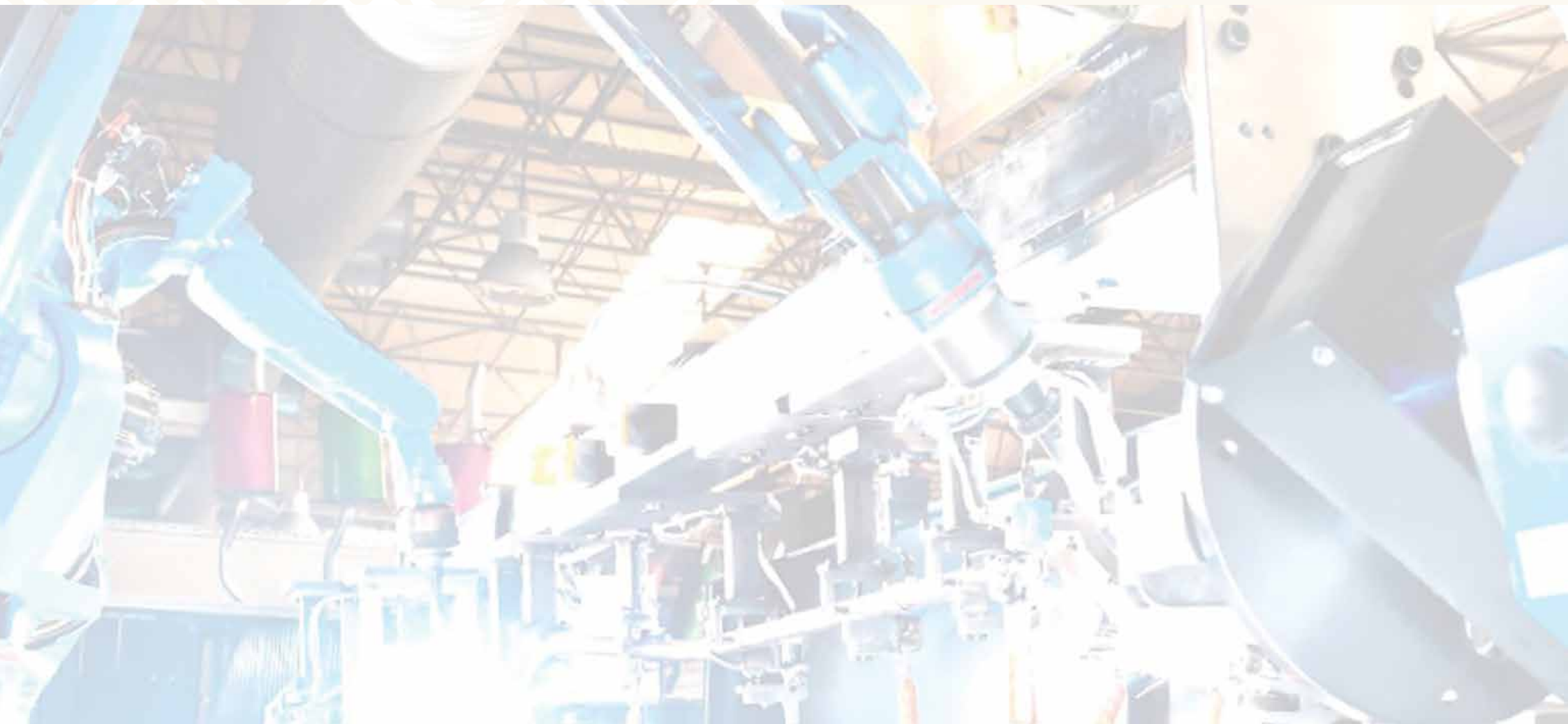




INDUSTRIAL POLICY ACTION PLAN

PART 2

IPAP 2017/18 – 2019/20



the dti CAMPUS: 77 Meintjies Street, Sunnyside, Pretoria, 0002 | **the dti POSTAL ADDRESS:** Private Bag X84, Pretoria, 0001
the dti CUSTOMER CONTACT CENTRE: 0861 843 384 | **the dti WEBSITE:** www.thedti.gov.za

ISBN: 978-0-621-45368-3 | **RP:** 108/2017

CONTENTS

IPAP PART 2: THE ENGINE ROOM OF INDUSTRIAL POLICY...	6
--	---

IPAP IN CONTEXT: ECONOMIC ANALYSIS.....	7
---	---

The global context.....	8
-------------------------	---

The South African economy.....	15
--------------------------------	----

SECTOR DESK REPORTS & KEY ACTION PROGRAMMES.....	38
--	----

IPAP 2017/18 – 2019/20: TRANSVERSAL FOCUS AREAS.....	39
--	----

1. Public procurement.....	40
----------------------------	----

2. Industrial Financing.....	48
------------------------------	----

3. Technical Infrastructure.....	51
----------------------------------	----

4. Competition Policy.....	61
----------------------------	----

5. Export promotion and support.....	63
--------------------------------------	----

6. African Industrial Development.....	64
--	----

7. Special Economic Zones (SEZs).....	70
---------------------------------------	----

8. Innovation & Technology.....	72
---------------------------------	----

SECTORAL FOCUS AREAS	84
----------------------	----

1. Automotives.....	85
---------------------	----

2. Clothing, Textiles, Leather & Footwear.....	89
--	----

3. Metal fabrication, capital & rail transport equipment.....	99
---	----

4. Agro-processing.....	108
-------------------------	-----

5. Forestry, Timber, Paper and Pulp, and Furniture.....	117
---	-----

6. Plastics, pharmaceuticals, chemicals & cosmetics.....	128
--	-----

7. Primary minerals beneficiation.....	145
--	-----

8. Green industries.....	156
--------------------------	-----

9. Water and Sanitation Outlook.....	166
--------------------------------------	-----

10. Business Process Services.....	173
------------------------------------	-----

11. Marine Manufacturing & Associated Services Industry.....	178
--	-----

12. Aerospace and Defence.....	183
--------------------------------	-----

13. Electro-technical and white goods industries.....	188
---	-----

dti KEY PARTNERS AND TECHNICAL SUPPORT INSTITUTIONS.....	195
--	-----

ABBREVIATIONS AND ACRONYMS.....	199
---------------------------------	-----

IPAP PART 2: THE ENGINE ROOM OF INDUSTRIAL POLICY

- **IN-DEPTH ECONOMIC ANALYSIS: GLOBAL & DOMESTIC**
- **2016/17 REPORTS FROM dti SECTOR DESKS**
- **KEY ACTION PROGRAMMES 2017-2020**
 - TARGETED OUTCOMES AND IMPACTS
 - KEY MILESTONES
 - LEAD & SUPPORTING DEPARTMENTS/ AGENCIES

- **TRANSVERSAL (CROSS-CUTTING) FOCUS AREAS**
 - WITH GRAPHICAL MIND-MAP
- **SECTOR-SPECIFIC FOCUS AREAS I & 2**
 - WITH GRAPHICAL MIND-MAPS
- **CASE STUDIES: SUCCESS STORIES IN PUBLIC-PRIVATE SECTOR SUPPORT & COLLABORATION**



IPAP IN CONTEXT: GLOBAL AND LOCAL ECONOMIC ANALYSIS

IPAP IN CONTEXT: ECONOMIC ANALYSIS



THE GLOBAL CONTEXT

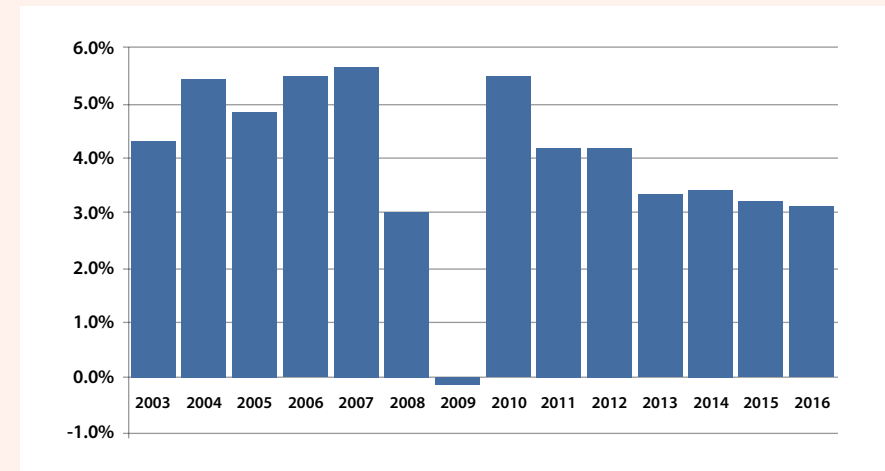
The past two years saw a deterioration in the already-fragile international economy, with international growth declining steadily from 4,2% in 2011 to 3,1% in 2016. The slowdown contributed to growing political and policy uncertainty in major trading partners. These trends continue strongly to affect industrialisation and inclusive growth in South Africa, and require coherent and effective responses from industrial policy.

Slow global growth marks a structural shift in the global economy, reflected in both the global financial crisis in 2008/9 and the abrupt end of the commodity boom in 2011. The underlying structural dilemma results from the shift of manufacturing to China and the neighbouring economies, leading to worsening employment conditions in other upper-middle-income economies (including South Africa) as well as the global North; the related growth in international capital flows and debt; and the associated increase in inequality. Taken together, these trends increased both economic and political instability, making it difficult to anticipate even relatively short-term economic developments on the world stage.

This section first reviews trends in global growth, and the impact on international trade and investment. It then outlines factors behind the slowdown.

As Graph 1 shows, global economic growth has declined steadily from 2010. International economic expansion since 2010 has averaged 2% less than it was in the five years leading up to the global crisis in 2008/9. The level of global growth over the past 20 years is probably exaggerated by somewhat overstated figures for growth in China, but the trend is clear.

Graph 1. Growth in the world economy, 2003 to 2016*

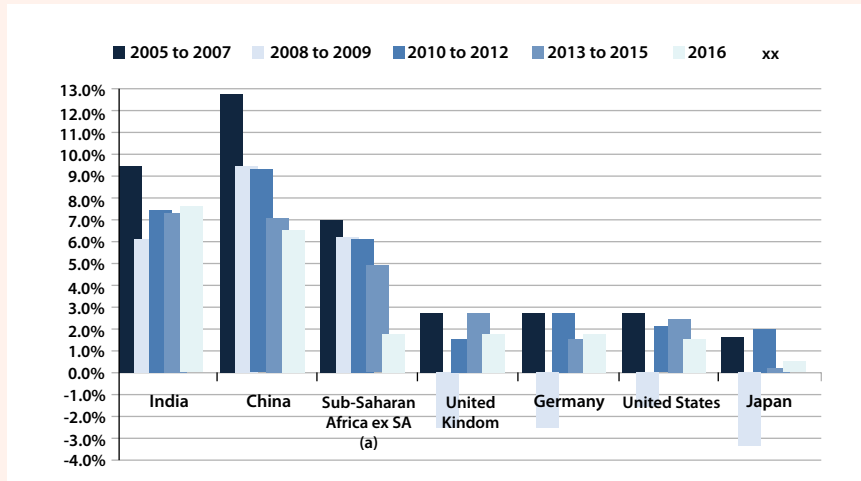


* Estimate for 2016.

Source: IMF, World Economic Outlook October 2016. Electronic database. Series on world GDP growth. Downloaded from www.imf.org in January 2017.

The trends in growth in South Africa's major trading partners – China, the U.K., Germany, the U.S., Japan and sub-Saharan Africa – reflect the structural crisis in the world economy since 2008/9. None of these countries has seen growth to equal the pre-crisis period, and most experienced a marked slowdown from 2012.

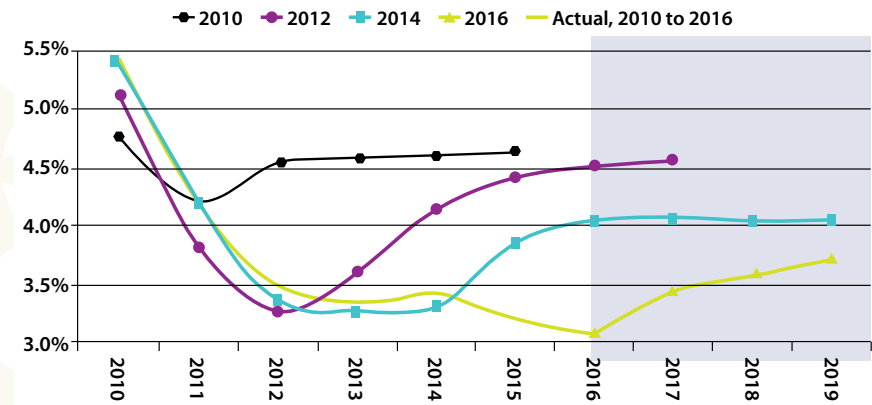
Graph 2. Growth in South Africa's main trading partners, 2005 to 2016



Notes: (a) Calculated using figures for nominal GDP and growth in constant terms for South Africa and for total sub-Saharan Africa. Source: IMF. World Economic Outlook October 2016. Electronic database. Series on GDP growth for relevant countries and for sub-Saharan Africa. Downloaded from www.imf.org in January 2017.

The persistence of slow growth has confounded predictions of a return to pre-crisis levels of growth internationally. As the following chart shows, since 2010 the IMF's forecasts for world growth have consistently proven to be overly optimistic. Over the past six years, actual growth in the world economy has consistently been around 1% below the IMF projections.

Graph 3. IMF projections for world GDP

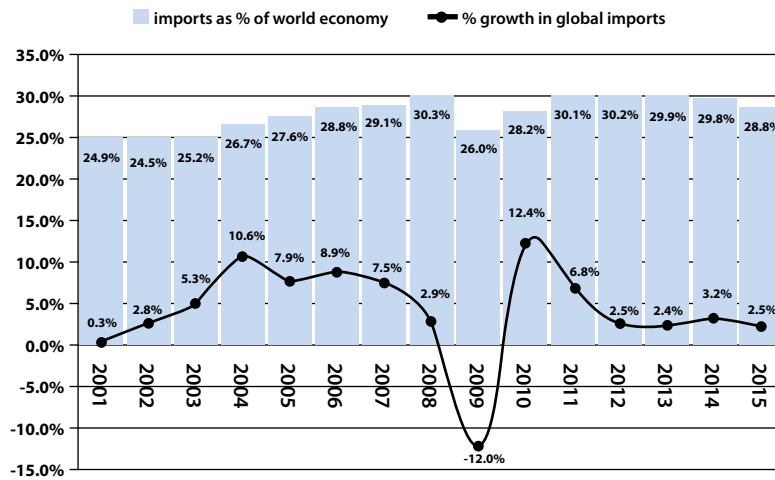


Source: IMF. World Economic Outlook, October 2010, 2012, 2014 and 2016. Electronic database. Series on GDP world GDP growth. Downloaded from www.imf.org in January 2017.

The global slowdown affects South Africa primarily through narrowing export markets and reduced capital inflows.

Overall, imports declined as a percentage of the global GDP from 30,2% in 2011 to 28,8% in 2015. In 2001, the share had been just 25%.

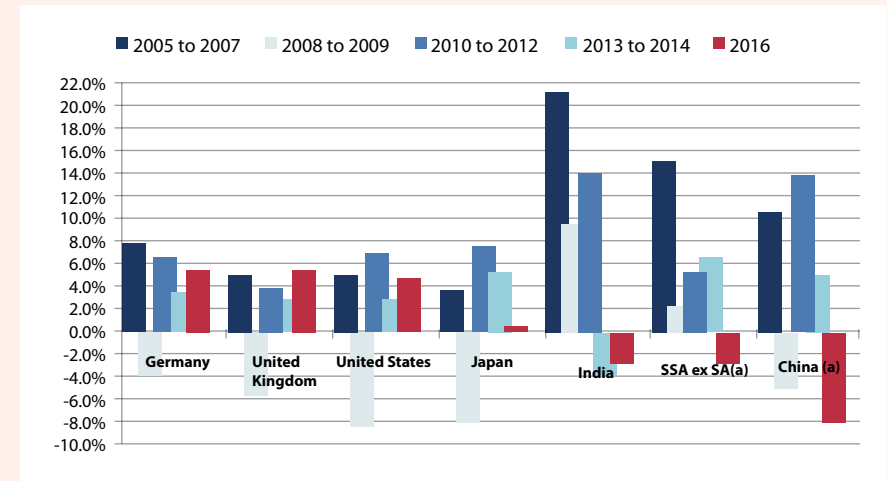
Graph 4. Growth in global imports and change in imports as percentage of world GDP, 2001 to 2015



Source: World Bank. World Development Indicators. Electronic database. Series on imports as percentage of world GDP and annual percentage growth in imports of goods and services. Downloaded from www.worldbank.org in January 2017.

The slowdown in trade from 2012 was largely driven by South Africa's main trading partners. As Graph 5 shows, in 2016 Germany, the U.K. and the U.S. saw some recovery in imports in 2015. But China, India and the rest of sub-Saharan Africa – markets that became increasingly important for South Africa during the commodity boom – saw a sharp fall in foreign purchases.

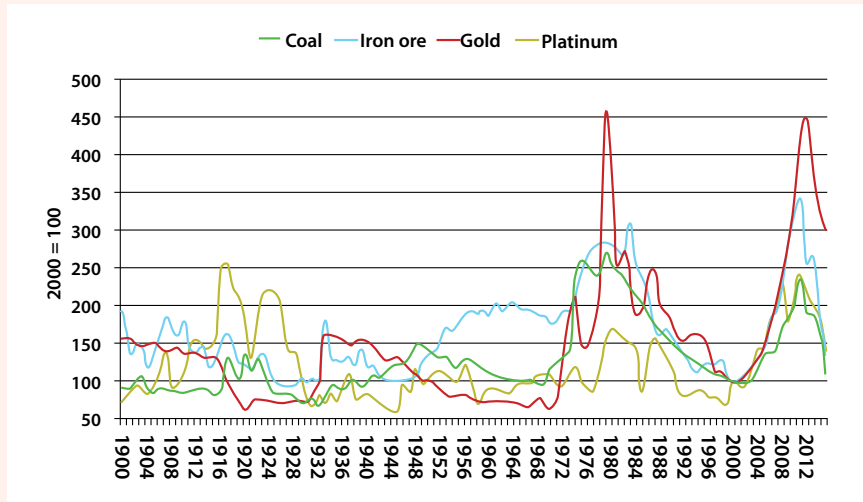
Graph 5. Growth in imports of goods & services by major trading partners, 2005 to 2016



Note: (a) Estimated based on figures for GDP in constant USD and imports as % of GDP. Source: World Bank. World Development Indicators. Electronic database. Series annual percentage growth in imports of goods and services. Downloaded from www.worldbank.org in January 2017.

In 2011, slowing global trade brought an abrupt end to the commodity boom that started in the 2000's. The persistence of high commodity prices for three years after the global financial crisis largely reflected speculation around China's enormous infrastructure investments. The result was a thirty-year spike in metals prices, led by iron ore, in 2010/11, followed by a sharp decline, as Graph 6 shows. Although commodity prices have stabilised, recovery to 2011 price levels seems unlikely in the foreseeable future.

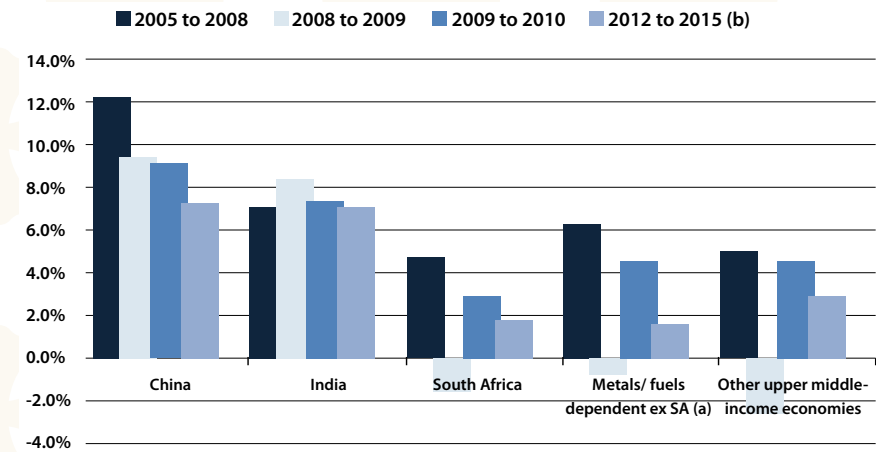
Graph 6. Index of prices of leading South Africa mining products in constant U.S. dollars, 1900 to 2015 (2000 = 100)



Source: Calculated from Jacks, D.S. 2016. Chartbook for “From Boom to Bust.” February. Downloaded from www.sfu.jacks.ca in June 2016. Update of David S. Jacks. 2013. “From Boom to Bust: A Typology of Real Commodity Prices in the Long Run,” NBER Working Paper 18874.

The commodity boom had a marked impact on mining-dependent economies (including petroleum exporters). Together these countries, which include South Africa, account for around 60% of output for middle-income economies excluding China and India. Their growth was unusually rapid before 2008, during the commodity boom, but much slower than for other middle-income economies after 2012. Half of South Africa’s exports derive from mining, but compared to other mining-dependent economies it saw both slower growth before 2008 and less of a crash after 2012.

Graph 7. Growth rate in metals and fuel dependent economies (a) compared to other upper-middle-income economies, 2005 to 2015

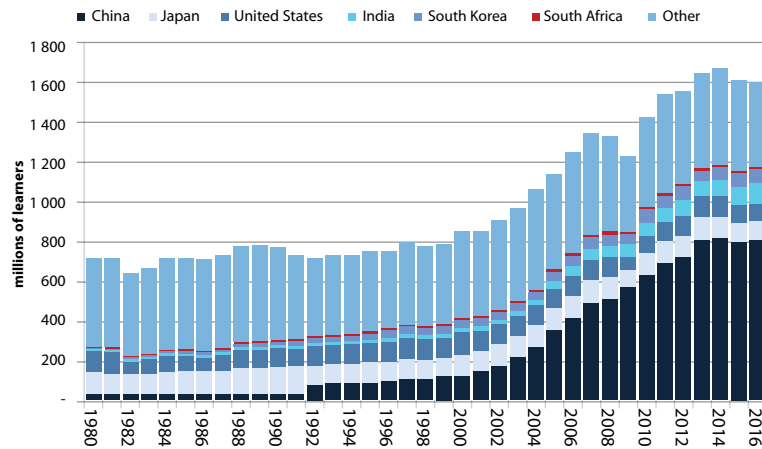


Note: (a) Thirty upper-middle-income countries are defined as metals and fuel dependent, and 60 are not included in this group. Metals and fuel dependent economies are here defined as having at least 25% of exports from mining or fuel production. The group includes Brazil and Botswana, which are considered commodity dependent by UNCTAD although the export figures provided in the World Development Indicators show a lower level of mining exports. Libya and Syria are excluded because no GDP data are provided for them. (b) Figure for GDP growth in 2015 for Venezuela, Iran, Mauritania and Papa New Guinea are extrapolated from 2014 because data were not provided. Source: World Bank. World Development Indicators. Electronic database. Series on GDP in constant U.S. dollars. Downloaded from www.worldbank.org in January 2017.

Iron ore and steel experienced the greatest price run up during the commodity boom, and the sharpest decline thereafter. This situation largely reflected the rising importance of China as both a consumer and producer of steel.

As the following graph shows, China accounted for most of the global growth in steel production in the 21st Century. After 2011, it slowed its infrastructure investment but did little to reduce support for its steel sector. The resulting over-production brought a rapid rise in Chinese steel exports, a sharp fall in world prices, and the loss of steel capacity in many other countries, including South Africa. In addition, over-investment in iron ore production in Australia and Brazil seem likely to hold down prices for iron ore for the foreseeable future.

Graph 8. Global steel production by country, 1980 to 2014



Source: WorldSteel. Crude steel production, 1980-2015 and monthly data for 2016. Downloaded from www.worldsteel.org in March 2017

Iron ore was South Africa's largest single export in 2010 and 2011, but it slipped behind platinum, coal-based petrol and auto after 2013. According to SARS data, South Africa's iron ore exports fell from a peak of R81.7 bn in 2013 to R52.5 bn in 2015; recovering marginally to R53.2 bn in 2016.

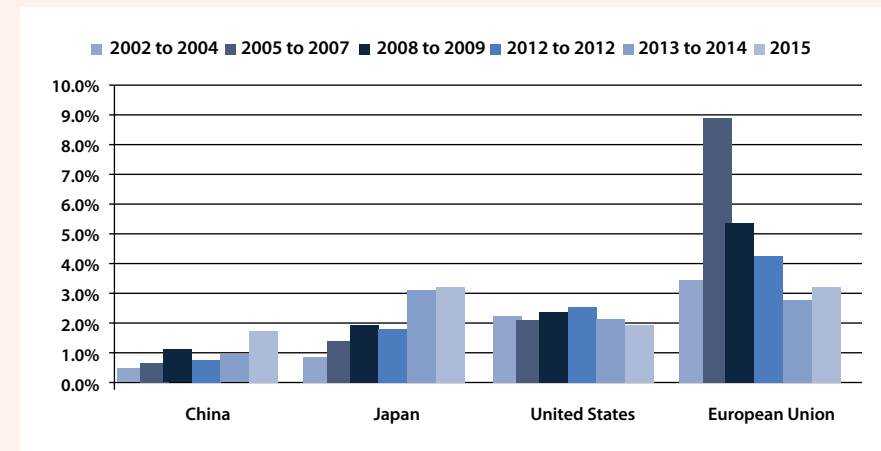
The fall in commodity prices also saw a sharp decline in energy costs. In 2014/5, petroleum and coal prices fell by around half in dollar terms. For net petroleum importers like South Africa, the result was a significant fall in import costs. That in turn helped offset the slowdown in export revenues. South Africa's petroleum imports stabilised in dollar terms at around US\$22 billion from 2011 to 2014, then fell to US\$10 billion in 2016. In rand terms, petroleum imports fell from R250 billion in 2014 to under R150 billion in 2016.

Like trade, international trends in foreign investment mirrored global growth, increasing significantly before 2008 but stagnating thereafter. Portfolio investment¹ climbed particularly sharply through 2008, but proved far more volatile than direct investment.

¹ Defined as investments that do not give the investor effective control of the business.

Outward investment by Europe and the United States, which accounted for over half of the total, declined sharply after 2008. European outward investment dropped by 57% from 2008 to 2015, and U.S. investment fell by 11%. In contrast, Chinese investment more than doubled, but it was only around a quarter as much as the European total and half the U.S. total.

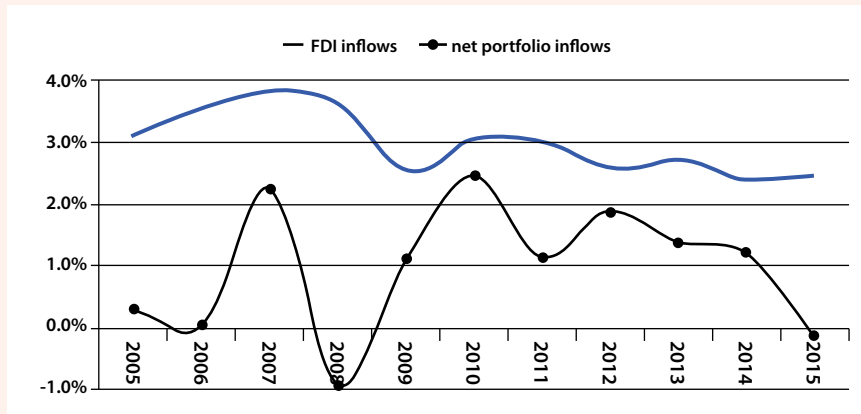
Graph 9. Foreign direct investment outflows by major economies, 2002 to 2015



Source: World Bank. World Development Indicators. Electronic database. Series on foreign direct outflows as percentage of GDP. Downloaded from www.worldbank.org in January 2017.

The decline in outward investment was mirrored by a fall in inward investment by middle-income economies, including South Africa. Foreign direct and portfolio investment into middle-income economies as a group fell relative to GDP in 2008, and then again after 2012. The sharp drop in portfolio investment from 2012 largely reflected the end of the commodity boom.

Graph 10. Inflows of foreign direct and net portfolio investment as percentage of GDP for middle-income economies, 2005 to 2015



Source: World Bank. World Development Indicators. Electronic database. Series on foreign direct inflows as percentage of GDP and net portfolio investment as percentage of GDP. Downloaded from www.worldbank.org in January 2017.

From 2002 to 2015, between 30% and 40% of total foreign direct investment into middle-income economies went to China, with around 10% for India. South Africa's share peaked at 2% in 2009, and since then has ranged between 1,4% and 0,3%.

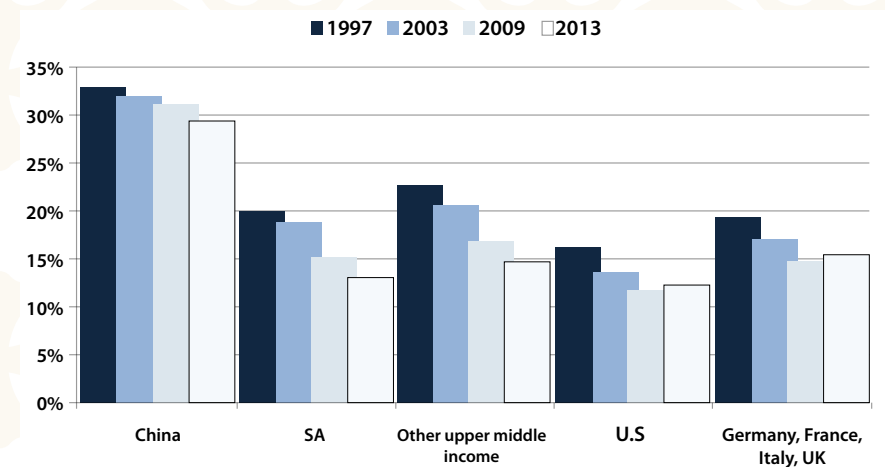
Net portfolio inflows were more volatile than direct investment in the noughts. Before 2008, South Africa saw extraordinarily high levels of portfolio investment and limited direct investment compared to its peers. In large part, this reflected the country's unusually sophisticated financial sector, which proved particularly supportive of institutional investment into mining and limited investment into manufacturing.

The international slowdown since the global financial crisis resulted from fundamental imbalances in the world economy. In effect, the forms of globalisation that emerged especially from the 1980s reached economic and political limits, and the path forward is hard to predict. Specific elements include the following:

From the 1990s, Chinese production of consumer manufactures increasingly displaced local production in other upper-middle-income countries and the global North. This move was facilitated by and reinforced increasingly complex forms of ownership and investment across value chains combined with improved logistics.

As Graph 11 shows, the share of manufacturing in value added declined everywhere, but the fall was particularly marked in upper-middle economies and in the U.S.

Graph 11. Manufacturing value added as percentage of GDP, 1997 to 2013

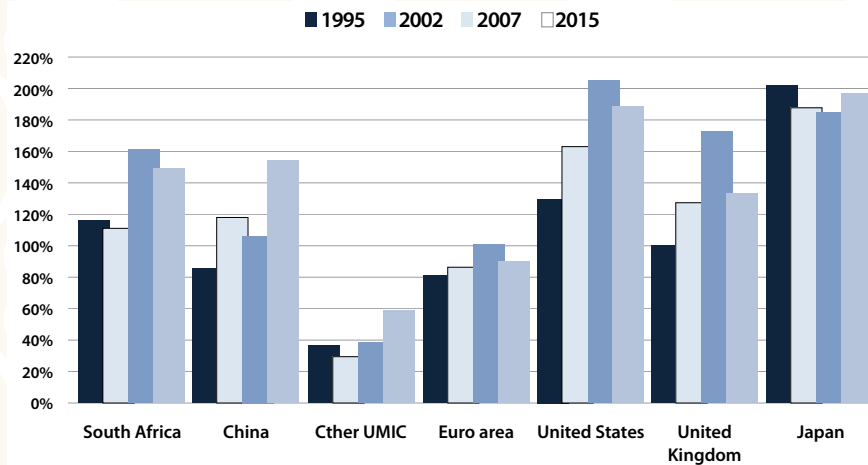


Source: Calculated from World Bank. World Development Indicators. Electronic database. Series on manufacturing value add as percentage of GDP and GDP in constant U.S. dollars. Downloaded from www.worldbank.org in January 2017.

The shift in the location of manufacturing production was associated with an increase in trade, investment and indirect control of value chains. These trends saw a rise in private debt finance, especially in the global North, reflecting a combination of the rather complex processes associated with the rapid expansion in international trade; the shift to new forms of investment and financial control over production as value chains began to span several countries; and the recycling of the Chinese balance of payment surplus especially with the U.S.

These factors also fostered speculation and the asset bubbles that led up to the 2008/9 global financial crisis, with a particularly sharp rise in debt in the U.S. and Europe from 2002 to 2007 followed by significant deleveraging. In China, the stimulus effort in response to the crisis saw an escalation in private borrowing from 2008.

Graph 12. Domestic credit to the private sector as percentage of GDP, 1995 to 2015



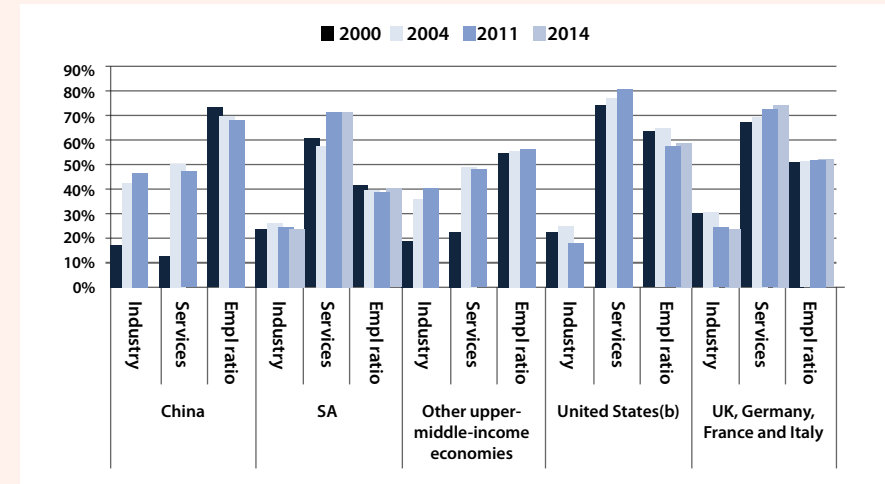
Source: Calculated from World Bank. World Development Indicators. Electronic database. Series on domestic credit to the private sector as a percentage of GDP and GDP in constant U.S. dollars. Downloaded from www.worldbank.org in January 2017.

The movement of manufacturing production toward China and its neighbours saw a parallel shift in employment from industry (which includes mining and construction as well as manufacturing) to services in the U.S. and Europe. Because services typically have a dualised pay structure, with high remuneration for professionals supported by a host of relatively poorly paid, low skill jobs, the change in the composition of employment brought lower pay for many workers and rising inequality.

In real terms, the pay of workers as a group tended to stagnate, while the share of the top decile in incomes tended to increase. In the U.S., the total share of working age adults with employment – the employment ratio – also declined steadily from the turn of the Century.

In contrast, upper-middle-income economies as a group (but not South Africa generally) saw a rapid increase in the share of both industry and services in total employment, essentially drawing people out of agriculture.

Graph 13. Share of employment in industry and services and employment ratio (a), 2000 to 2014



Source: Calculated from World Bank. World Development Indicators. Electronic database. Series on share of employment in industry and services, share of working age population in total, share of working age population with employment and total population. Downloaded from www.worldbank.org in January 2017.

Taken together, these trends in the global economy increased its fragility and underpinned the global slowdown over the past eight years. As with any period of major structural change, it is not easy to predict the outcome and where the new sources of growth will emerge.

From the standpoint of South Africa, the economic slowdown in China and the profound policy uncertainty emerging in the U.S. and the U.K. will have a particularly significant impact on prospects for the coming year. These factors mean that international trade will likely continue to grow relatively slowly. In particular, any shift toward protectionism in the global North could affect South Africa both directly, through its own exports, and by slowing growth in China.

Beyond the immediate negative effects of slow global growth, there may be some opportunities for development. In particular, the end of the commodity boom has brought about a significant depreciation of the rand. That in turn has made South African manufacturing and value-added services more competitive.

THE SOUTH AFRICAN ECONOMY



This section analyses major trends in the South African economy that shape IPAP projects and programmes. It reviews the economic outcomes overall and in manufacturing. It then assesses the implications of the end of the commodity boom; persistent socio-economic inequalities and joblessness; the unusually extensive financialisation of the South African economy; the national infrastructure programme; and efforts to reduce carbon emissions. The final section briefly outlines the strategic implications of these trends for IPAP.

Trends in growth, employment and investment

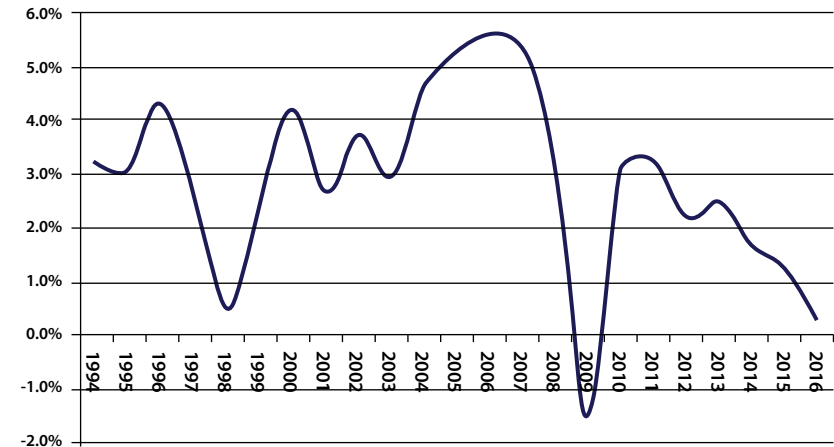
The fragile global economy was a critical factor behind slowing growth in South Africa in 2016. Manufacturing fared worse than the rest of the economy in terms of output, employment and investment, largely because the end of the 2008/9 global crisis and the end of the commodity boom weighed down on the metals value chain.

Other exacerbating factors were:

- the worst drought on record in South Africa, affecting not only primary agriculture, but, through strong linkages, also adversely affecting its entire supply chain;
- a very challenging domestic consumer environment, including higher interest rates, rising living costs and tighter lending practices;
- a sharp drop in fixed investment;
- adverse developments in commodity markets such as weaker demand (although commodity prices have rebounded from the worst lows of 2015).

As Graph 14 shows, economic growth tended to decline after the initial recovery from the 2008/9 global financial crisis.

Graph 14. GDP growth, 1994 to 2016



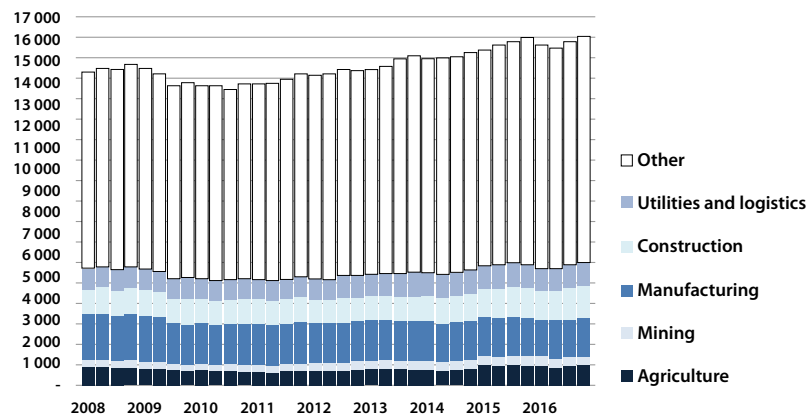
Source: Calculated from Statistics South Africa. GDP data from 1993. Excel spreadsheet. Series on actual GDP in constant (2010) rand by quarter. Downloaded from www.statssa.gov.za in March 2017.

Employment climbed quite rapidly from 2003 to 2008 - mostly on the back of jobs created in the services sector and government - but also mining sector jobs related to the commodity price boom.

However, a million jobs were lost in the 2008/9 downturn.

Jobs recovery started in late 2010 and employment reached a new high of 16 million late in 2015. But total employment reportedly declined by half a million from December 2015 to June 2016; most notably, in manufacturing employment, which currently stands at about 20% lower than the employment level in Q1 2008.

Graph 15. Quarterly employment by industry, 2008 to 2016 (a)



Note: (a) In 2015 a new sampling frame was introduced, which may have led to an overstatement of growth in the final three quarters of the year. Source: Statistics South Africa. QLFS Trends 2008 – 2016 Q4. Excel spreadsheet. Table 2. Downloaded from www.statssa.gov.za in March 2017.

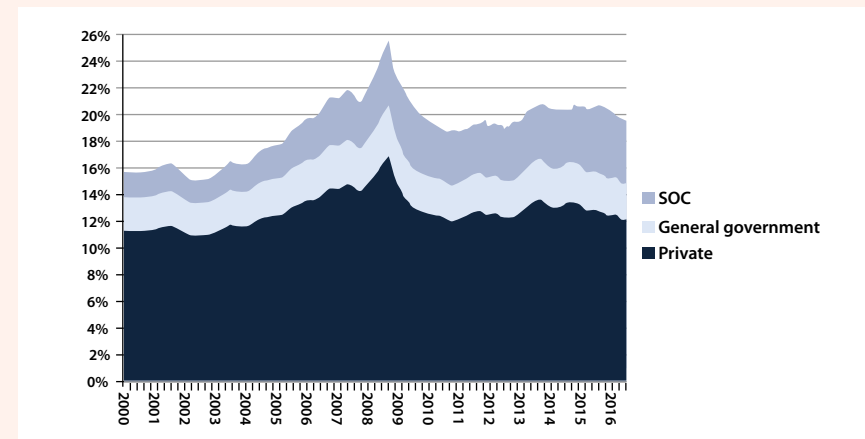
From 1994 to 2016, employment grew by almost six million or around 2,4% a year, while the working-age population rose at just 1,6% a year. Still, the rate of job creation was too low to qualitatively reduce the extraordinary levels of joblessness inherited from apartheid. The share of working age adults with employment rose from around 39% in 1994 to a peak of 46% in 2008, and stood at around 43% in 2016.

By comparison, the global employment ratio is between 55% and 60%, and over 60% for upper-middle-income economies. It would take 50 years for South Africa to reach that level if employment grew at the rate seen from 2011 to 2016. To reach the average employment rate for peer economies by 2027, employment would have to grow more than twice as fast, at close to 5% a year.

Investment increased rapidly with the start of the commodity boom around 2003. It fell sharply in the 2008/9 downturn, however, and recovered only partially before falling again from early 2015. But the aggregate figures hide divergent trends in public and private investment. While private investment began to fall from the end of 2013, public investment kept growing for two more years.

Then, from in the year to September 2016, government investment dropped by 7%, essentially due to a more restrictive fiscal stance. Investment by state-owned companies, mostly on infrastructure, also began to decline from early 2016.

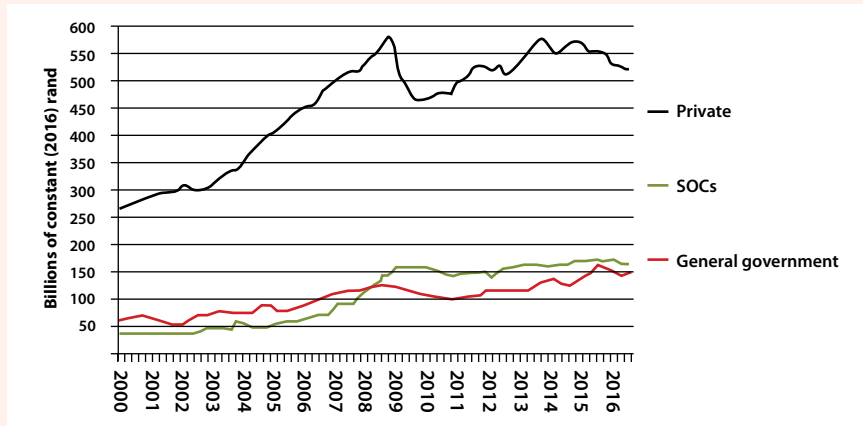
Graph 16. Quarterly investment by private business, general government and state-owned corporations, in constant 2016 rand, seasonally adjusted, 2000 to September 2016



Source: Calculated from, South African Reserve Bank. Interactive database. Series on quarterly investment by type of organisation in current and constant rand. Downloaded from www.resbank.co.za in March 2017.

The investment rate – that is, the share of investment in the GDP – rose from 13% in 1994 to a peak of just under 25% before the 2008/9 global financial crisis. It dropped to 19% in the crisis, recovered to 21% five years later, but fell back to 19% in September 2016. As a rule, an investment rate of 20% to 25% is required for sustained and rapid economic expansion.

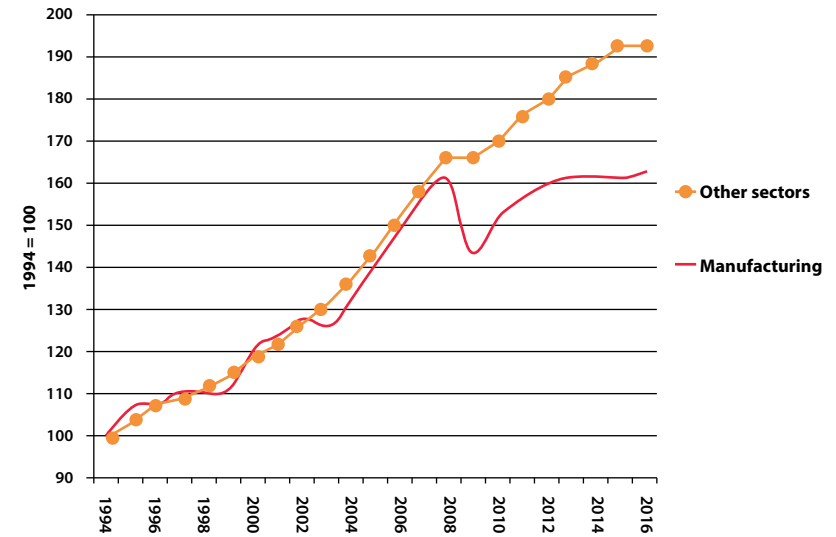
Graph 17. Quarterly investment rate (a) by type of organisation



Note: (a) Investment as percentage of GDP; both are seasonally adjusted and in current rand. Source: Calculated from, South African Reserve Bank. Interactive database. Series on quarterly investment by type of organisation in current rand and GDP in current rand. Downloaded from www.resbank.co.za in October 2016.

The investment rate – that is, the share of investment in the GDP – rose from 13% in 1994 to a peak of just under 25% before the 2008/9 global financial crisis. It dropped to 19% in the crisis, recovered to 21% five years later, but fell back to 19% in September 2016. As a rule, an investment rate of 20% to 25% is required for sustained and rapid economic expansion.

Graph 18. Index of quarterly value added in manufacturing and the rest of the economy, 1994 to 2016 (1994 = 100)

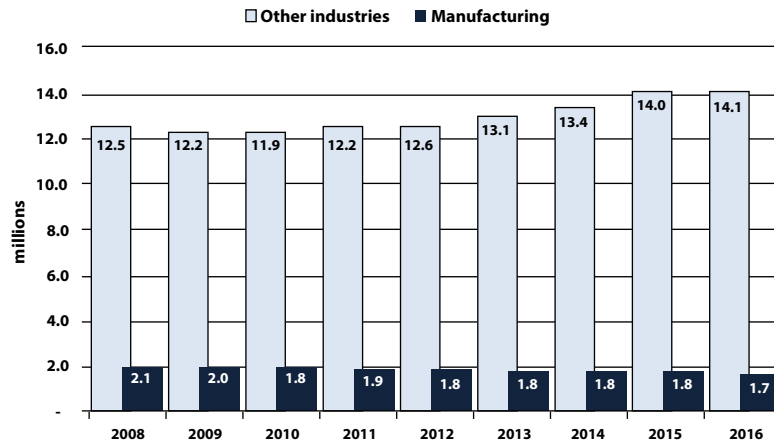


Source: Calculated from Statistics South Africa. GDP data from 1993. Excel spreadsheet. Series on Manufacturing and Total Value Added in constant rand, annualised and seasonally adjusted. Downloaded from www.statssa.gov.za in March 2017.

While employment in the rest of the economy expanded after the 2008/9 downturn, it failed to recover in manufacturing. From Q1 2008 to Q2 2016 manufacturing shed almost 400,000 jobs. Job losses in the sector persisted for most of the period from 2010 to 2016, even as other sectors began to create jobs.

From the fourth quarter of 2010 to the fourth quarter of 2016, manufacturing shed over 150,000 jobs while the rest of the economy generated 2,3 million new ones.

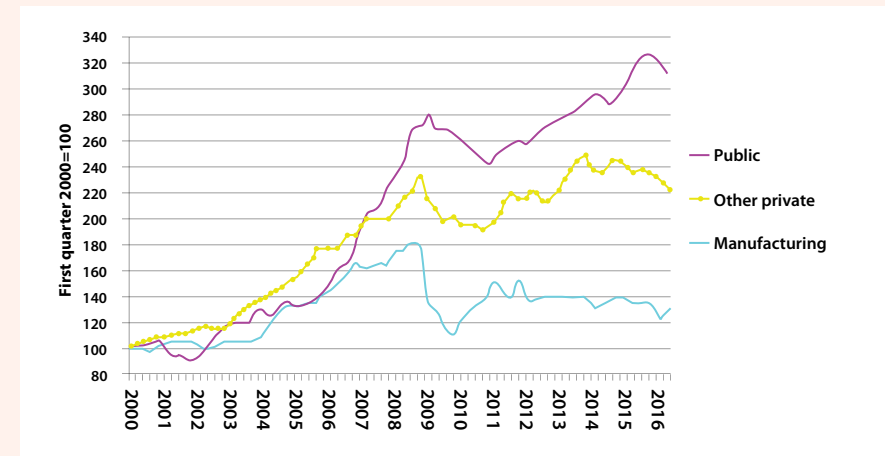
Graph 19. Employment in manufacturing and the rest of the economy, 2008 to 2016 (a), in millions



Note: (a) Average for calendar year. Source: Calculated from Statistics South Africa. QLFS Trends 2008 – 2016 Q4. Excel spreadsheet. Table 3.1. Downloaded from www.statssa.gov.za in September 2016.

Manufacturing investment performed noticeably worse than other private investment both during and after the commodity boom. It climbed by 77% from the second quarter of 2000 to the second quarter of 2008, but subsequently fell more sharply than investment in other sectors and saw a relatively truncated recovery. In 2010, manufacturing investment remained almost 20% below its 2008 peak, but it began to decline again. From 2010 to September 2016, it then fell by around 15%. In contrast, private investment in other sectors continued climbing through 2014, when it reached 6% above its 2008 level, before falling by 4% in the following two years.

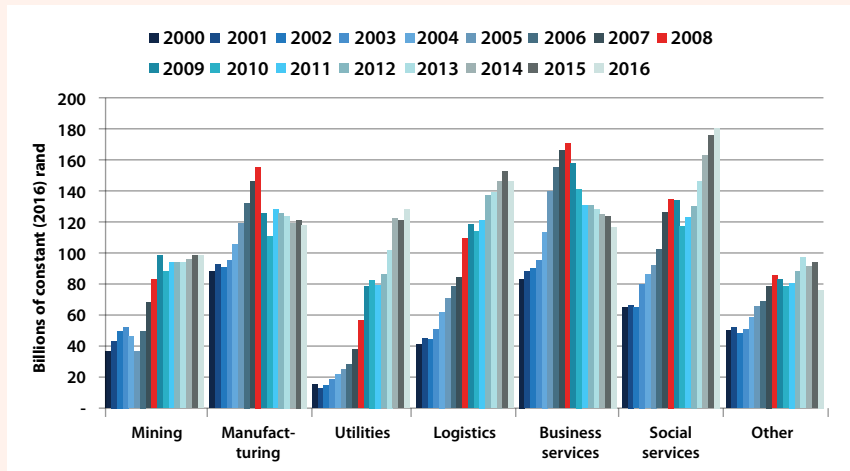
Graph 20. Index of quarterly investment in manufacturing compared to other private and to public investment, seasonally adjusted in constant terms



Source: Calculated from, South African Reserve Bank. Interactive database. Series on quarterly investment by type of organisation and sector in constant seasonally adjusted rand. Downloaded from www.resbank.co.za in March 2016.

As the following graph shows, in constant rand investment in manufacturing fell behind business services, including finance, in the run up to the 2008/9 global financial crisis, while mining investment increased. After the crisis, mining investment flattened out while infrastructure and social services investment climbed rapidly. In contrast, investment in manufacturing and business services declined. These trends largely reflected the efforts of the state to maintain a counter-cyclical stance, which it tapered off from around 2014.

Graph 21. Investment in major sectors in year to third quarter, 2000 to 2016, in constant rand



Source: Calculated from, South African Reserve Bank. Interactive database. Series on quarterly investment by type of organisation and sector in current and constant rand. Downloaded from www.resbank.co.za in March 2017.

The end of the commodity boom

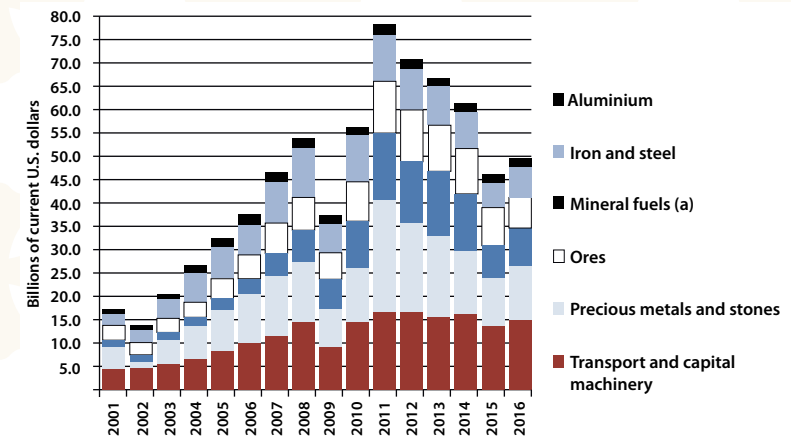
The sharp fall in global metals prices from 2011 affected the South African economy through a decline in revenues from mining and metals exports as well as lower foreign direct and portfolio investment. These trends were associated with a decline in both production and employment in mining and metals, and a fall in the dollar cost of petroleum imports. It also brought about a significant depreciation of the rand, which made manufacturing outside of the mining value chain more competitive but also increased the cost of imported inputs. Finally, largely due to slow growth in tax revenues because of these developments, fiscal consolidation was expected to intensify from 2016.

The most immediate impact came through trade, because of the importance of metals and iron ore for South African exports. From 2011, when the commodity boom ended, through 2016 the value of South Africa's total exports dropped by 31% in current dollars, although depreciation meant that they grew 6% in constant rand (deflated by CPI). In dollar terms, exports of metals and metal products fell by 44%, from \$62 billion to \$35 billion.

In contrast, exports of autos fluctuated between \$8 billion and \$9 billion. Capital machinery and equipment exports dropped by a third, from \$7,3 billion to \$5,1 billion, in part because of the slowdown in mining production globally and particularly in southern Africa. In rand terms, deflated for CPI, revenues for vehicles and machinery, including rolling stock and planes, were boosted by depreciation, rising some 40%.

The share of South Africa's top mining exports - iron ore and ferro alloys, platinum, coal and coal-based oil and gold - fell from over 40% of South Africa's total export revenues in 2011 to 30% in 2015. Mining, metals and basic metal products fell from 60% to 50%. Exports of vehicles and machinery and equipment climbed from around 17% for most of the 'noughts to 20% in 2016.

Graph 22. Exports of ores, metals and metal products, liquid fuels (a) and vehicles and other machinery current U.S. dollars, 2001 to 2016.



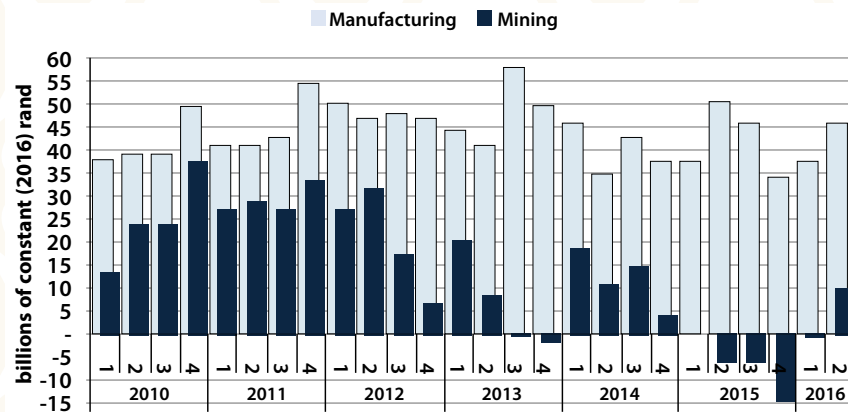
Note: (a) Mostly coal and coal-based petroleum exports, the latter principally to Southern African countries. Source: Calculated from TradeMap. Interactive database. Series on South African exports by 2-digit HS codes. Downloaded from www.trademap.org.in October 2016.

The decline in export revenues led to a slowdown in mining and metals production, with a fall in the value of production, profits and employment.

The value of mining production in rand deflated by the CPI almost doubled from early 2000 through 2012, then fell by close to 15% through mid-2016².

As a whole, mining suffered declining profits from mid-2012, with losses from the first quarter of 2015 to the first quarter of 2016. Mining employment fell by 15% or around 80 000 jobs from its peak in 2012 through the third quarter of 2016. These factors had significant knock-on implications for the rest of the economy.

Graph 23. Quarterly profits in mining and manufacturing in constant (2016) rand



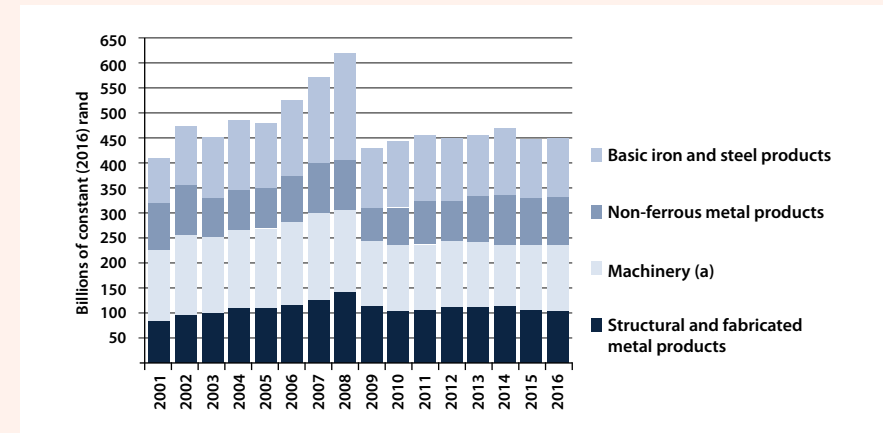
Source: Calculated from Statistics South Africa. Quarterly Financial Statistics. Estimates for small, medium and large enterprises by industry for relevant quarters. Excel spreadsheets. Downloaded from www.statssa.gov.za in relevant years.

In contrast to mining, beneficiation never fully recovered from the 2008 crash. In part, this situation reflected the rapid increase in electricity prices from 2008, which had a particularly harsh effect on electricity-intensive refineries. In constant rand, sales of iron and steel and non-ferrous metals dropped by 40% in 2008/9. From 2009 to 2016, steel production lost another 6%, but non-ferrous metals recovered.

² In volume terms, the value of mining output remained almost unchanged through the commodity boom, mostly because of the maturing of the gold mines and the associated fall in production. Deflation by CPI, rather than using constant prices, permits an understanding of the how incomes – both profits and wages – evolved in the industry relative to the rest of the economy.

Fabricated metals and machinery sales dropped 20% in real terms in 2008/9, and then fell a further 6% from 2009 to 2016. In contrast, the rest of manufacturing fell 16% in 2008/9, but saw a 14% growth in sales from 2009 to 2014. From 2014 to 2016, however, sales in manufacturing outside of heavy industry dropped by 2%.

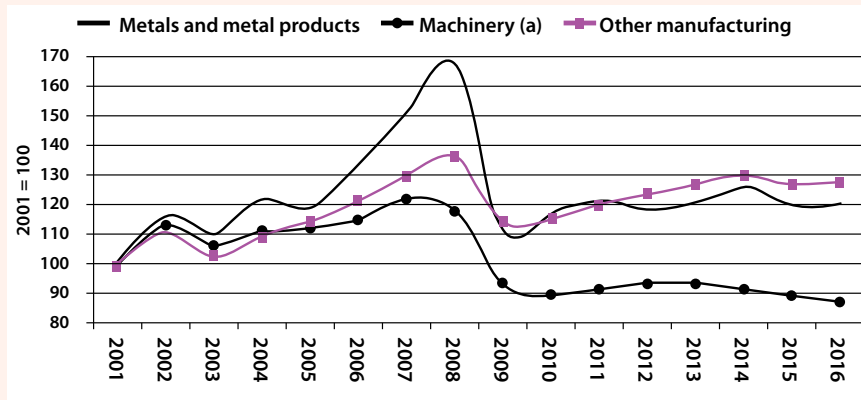
Graph 24. Sales of metals, metal products and machinery in billions of constant (2016) rand (a), 2001 to 2016



Note: (a) Current actual monthly sales figures in year to June, deflated by CPI. Source: Calculated from Statistics South Africa. Manufacturing production and sales. Excel spreadsheet. Downloaded from www.statssa.gov.za in March 2017.

The share of metals and machinery in total manufacturing sales dropped from 26% in 2008 to around 22% from 2013 to 2016. Graph 25 shows trends in metals, metal products and machinery compared to the rest of manufacturing.

Graph 25. Indices of sales of metals, metal products and machinery compared to the rest of manufacturing in constant (2016) rand (2001 = 100)

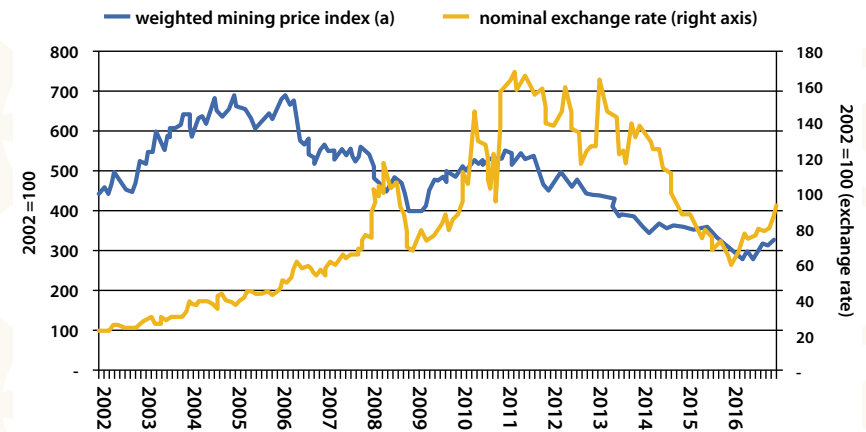


Note: (a) Current actual monthly sales figures in year to December, deflated by CPI. Source: Calculated from Statistics South Africa. Manufacturing production and sales. Excel spreadsheet. Downloaded from www.statssa.gov.za in March 2017.

The downturn in mining and heavy industry in turn affected producers of inputs, including capital goods and construction. It also constrained household demand, especially in areas that depended on mining and metals – notably the platinum belt in the North West and Limpopo, the ore towns of the Northern Cape, and heavy industrial centres in Mpumalanga and Gauteng.

As the value of South African metals exports fell, the rand became significantly more competitive. During the commodity boom, the currency was generally uncompetitive for manufactures. Depreciation after 2011 largely tracked the fall in metals prices, and was therefore unlikely to reverse in the foreseeable future.

Graph 26. Nominal trade-weighted value of the rand compared to weighted mining price index (a), January 2002 to November 2016



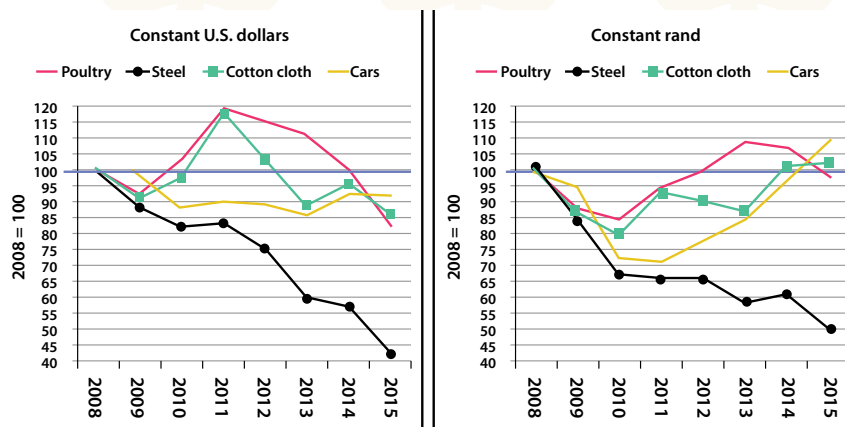
Notes: (a) Nominal U.S. dollar price weighted by share in exports of four top mining exports. Source: Exchange rate from South African Reserve Bank. Interactive dataset. Downloaded from www.resbank.org.za in March 2017. Nominal exchange rate weighted by 20 trading partners. Gold and platinum prices calculated from Kitco. Historic charts on gold and platinum. Downloaded from www.kitco.com in March 2017. Iron and coal prices from IMF. Monthly data on commodity prices. Excel spreadsheet downloaded from www.imf.org in March 2017.

The more competitive rand boosted manufacturing industry, making it easier both to export and to compete with imports. The auto industry stabilised exports in dollar terms from 2011 to 2016, which translated into a 60% increase in value in constant rand (deflated by CPI). By 2016 the auto industry had overtaken gold, platinum, iron ore and coal in export revenues. Depreciation also mitigated the impact of lower dollar prices in the mining value chain and promoted international tourism to South Africa.

The benefits of the more competitive rand were offset to some extent by higher prices for imported inputs as well as the persistence of relatively weak demand especially in Europe, Japan and China. Still, exports to the rest of Africa, which is the largest export market for South Africa’s manufactured goods, maintained fairly strong growth in recent years, although the region also showed signs of slowing growth from 2011.

At the same time, faced with the general global slowdown, companies from competing economies intensified efforts to export to South Africa. That led to a significant fall in the unit price in dollars of major imports such as steel, poultry, cloth and even cars, as Graph 27 shows. The unit price of imported steel and poultry declined even in rand terms, despite depreciation. The domestic steel industry was affected particularly harshly by low-cost imports from China, which faced a major over-supply crisis as its economy and infrastructure investment slowed.

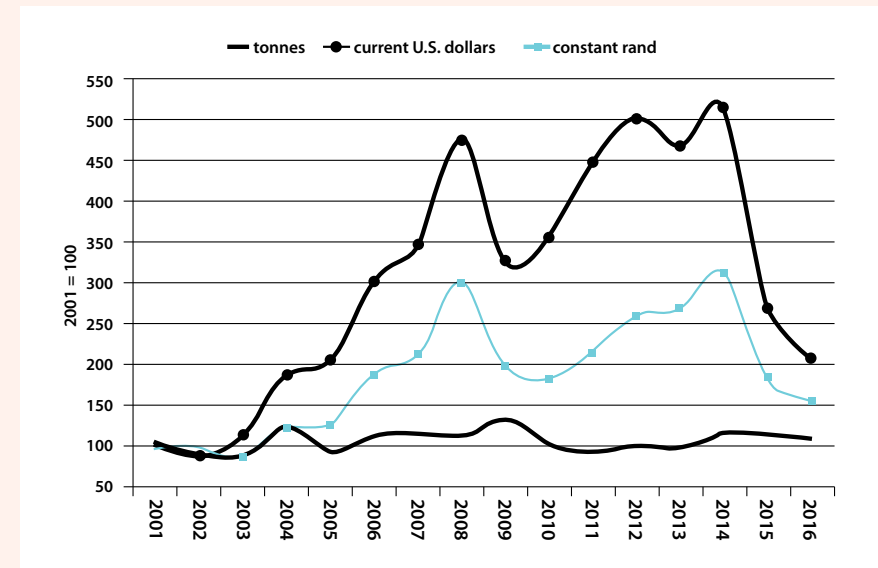
Graph 27. Index of unit prices in current dollars and constant rand of steel, poultry, cotton cloth and car imports, 2008 to 2015 (2008 = 100) (a)



Notes: (a) Unit prices per tonne deflated with relevant CPI. Steel comprises flat rolled steel (HS 7208, 7210 and 7225); cotton cloth is HS 5208; cars are HS8703; poultry is HS0207. Source: Calculated from TradeMap. Electronic database. Figures for South African imports by HS4 figures by value and quantity in tonnes. Downloaded from www.trademap.org in October 2016.

The end of the commodity boom brought about a decline in the prices of coal and petroleum, especially from 2014. During the commodity boom, as Graph 28 shows, the total cost of petrol imports increased sharply in both dollars and rand, although consumption remained almost unchanged. From 2011 to 2014, in dollar terms the cost levelled out, and it dropped by more than half from 2014 to 2016. As a result, petrol fell from 16% of total imports in 2014 to 9% in 2016.

Graph 28. Indices of petroleum imports in tonnes and in constant rand and dollars (deflated with CPI), 2001 = 100

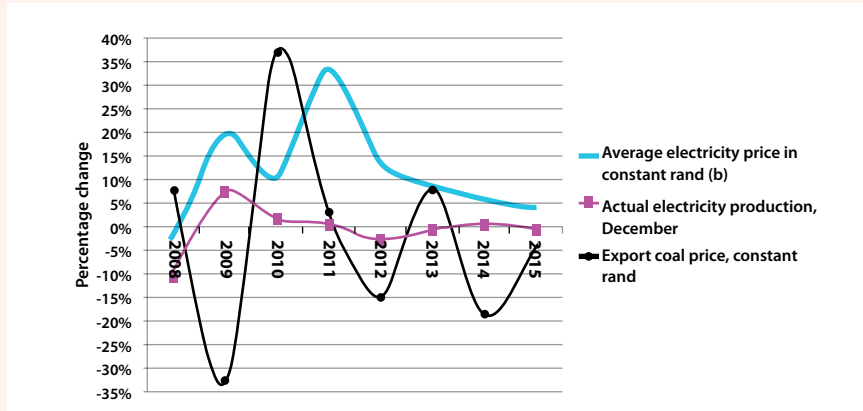


Source: Calculated from TradeMap. Electronic database. Figures for South African imports by HS4 figures by value and quantity in tonnes. Downloaded from www.trademap.org in October 2016.

Falling global energy prices also affected electricity costs in South Africa. The international price of coal in dollars fell by 56% from 2011 to 2015, and essentially levelled out in rand terms on the domestic market. At the same time, an oversupply of electricity began to emerge as the aluminium, steel and ferro-alloy refineries cut back on production³. Eskom therefore did not need to run expensive diesel-fuelled peaking generators. These factors combined meant that, after more than doubling from 2008 to 2011, electricity price increases gradually moderated, although they still exceeded CPI by 4% in 2014/5.

³ The oversupply only held as long as Eskom maintained relatively low reserve margins.

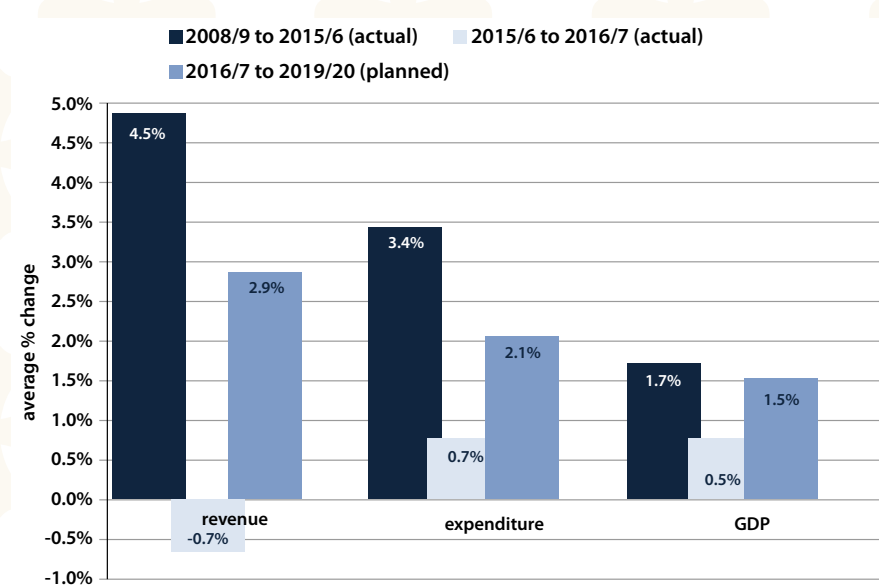
Graph 29. Average electricity price, electricity production in December, and export coal price (a), 2008 to 2015



Notes: (a) deflated with average CPI for the year. (b) Year to March. Source: Electricity price: Calculated from Eskom Annual Reports for relevant years, figures for electricity sales and revenues. Export coal price in rand: Index Mundi. Database. Downloaded from www.indexmundi.com in May 2016. Electricity generation: Statistics South Africa. Electricity sales from 2000. Excel spreadsheet. Index of actual production. Downloaded from www.statssa.gov.za in October 2016.

The end of the commodity boom led to slower growth in government revenues combined with rising demands for state support from the affected companies and communities. But the budget had gone into deficit to counter the crisis in 2008/9, so it proved difficult to sustain a counter-cyclical fiscal stance. As Graph 30 shows, growth in government spending was expected to decelerate from around 2016. In 2016/7, it was expected that revenues would fall in real terms by 0,7%, and spending would climb by a similar amount – less than half the growth in the population.

Graph 30. Fiscal policy indicators 2008/9 to 2019/20 (averages for periods; deflated with CPI (a))

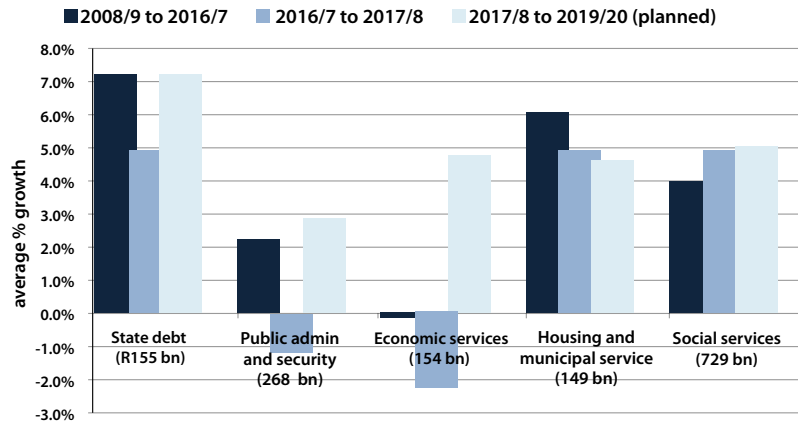


Note: (a) CPI figures and projections from 2016/7 Budget Review. Source: Calculated from National Treasury. Budget Review data in Excel format. Tables 1 and 2.2. Downloaded from www.treasury.gov.za in March 2017.

Slower growth in state spending meant less of a fiscal stimulus for economic growth. The implications could be understood in terms of the three main categories of state spending – investment in human capital, the provision of services and incentives for business, and investment in infrastructure, buildings and equipment.

As Graph 31 shows, the projected slowdown in spending from 2016/7 was expected mostly to affect public administration, security and economic services (of which around half constitutes transport). In contrast, the social services and housing were expected to grow faster than the population, although substantially slower than before 2016/7.

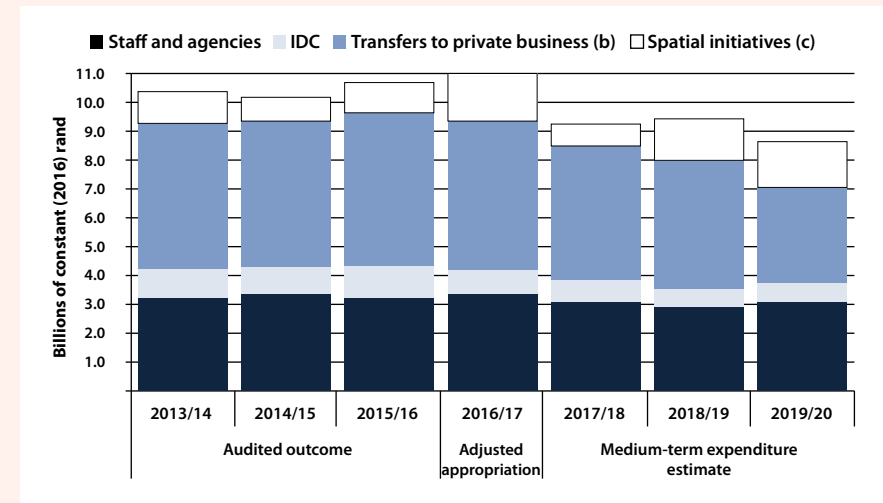
Graph 31. Average annual percentage change in spending by state function before and after 2017/8, in constant rand (a); total budget for function in 2016/7 in brackets



Note: Deflated using CPI; actual CPI through 2016/7 and from 2017/8 from Budget Review estimates. Source: Calculated from Budget Reviews for relevant years. Data in excel format. Annexure B, Table 6. Downloaded from www.treasury.gov.za in March 2017.

The projected decline in spending on economic services included a falling budget for **the dti**, and especially for its incentive programmes. As Graph 32 shows, in constant 2016 rand, **the dti**'s total budget was expected to decline by over 20%, from a high of R11,0 billion in 2016/7 to R8,6 billion in 2019/20. Transfers to private business were expected to fall by 35%, from R3,5 billion in 2016/7 to R3,4 billion in 2019/20.

Graph 32. Incentives and other components of dti budget, 2007/8 to 2018/9, in constant rand (a)



Notes: (a) Deflated using CPI from 2013/4 to 2016/7; thereafter using CPI projections from 2017 Budget Review. (b) Subsidies for manufacturing and services, and other transfers. (c) Transfers for SEZs, IDZs and critical infrastructure. Source: Calculated from Estimates of National Expenditure for the dti for 2017/8. Data in excel format. Downloaded from www.treasury.gov.za in March 2017.

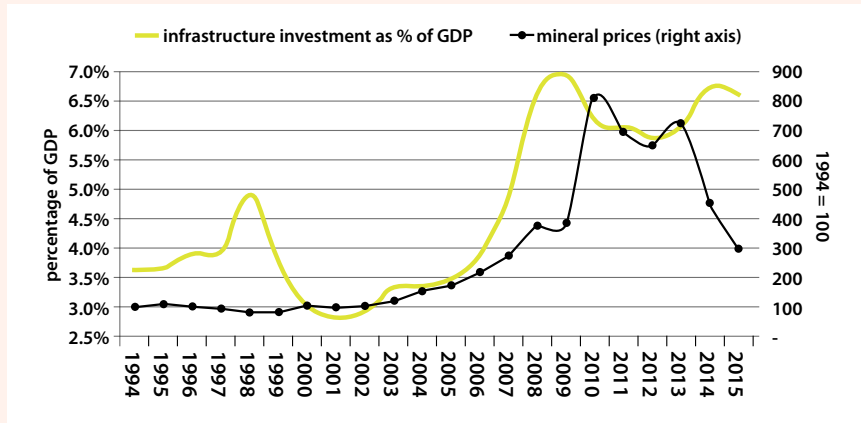
The bulk of increased government investment in human capital was anticipated in housing and municipal services, health and education, which were expected to climb by over 3% a year each through 2019/20, despite a slowdown in 2017/8. Social grants were projected to climb by 2,5% in the coming fiscal year, which should help sustain growth in food processing.

Lastly, public investment can provide both a major stimulus for producers of capital equipment and construction inputs, and promote broader economic efficiency by upgrading infrastructure, as long as the cost to users does not outweigh the benefits.

Sustaining and improving the targeting of public investment is therefore increasingly important to the industrialisation effort, especially in developing capacity around capital goods as well as facilitating growth in new industries and enterprises.

As the Graph 33 shows, public investment as a percentage of the GDP rose swiftly in line with the metals price, but then stabilised at between 7% and 8%. That approximated the recommended level for sustained economic development.

Graph 33. Public investment as a percentage of GDP compared to changes in the price of major metals exports (a), 2001 to 2015

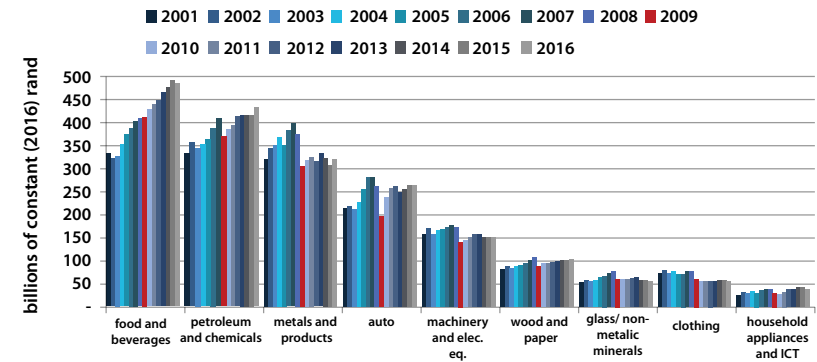


Notes: (a) Price in current U.S. dollars of iron ore, coal, gold and platinum weighted by share in trade. Source: Public investment and GDP data from South African Reserve Bank, interactive dataset, series on GDP and on government and SOC investment. Gold and platinum prices calculated from Kitco. Historic charts on gold and platinum. Downloaded from www.kitco.com in October 2016. Iron and coal prices from IMF. Monthly data on commodity prices. Excel spreadsheet downloaded from www.imf.org in October 2016.

For manufacturing, these developments brought significant shifts in sectoral growth. Capital goods and metals production generally slowed down, while output of consumer goods, especially agro-processing, tended to expand relatively steadily through 2015.

In 2015/6, the severe drought led to a decline in food and beverages production. Still, the share of food and beverages in manufacturing sales climbed from 17% in the year to June 2008 to 24% in the year to June 2016. In the same period, the share of metals and machinery fell from 27% to 23%.

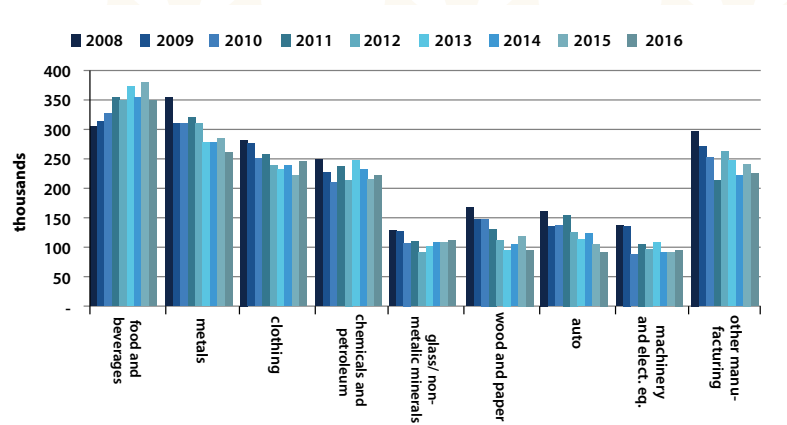
Graph 34. Sales by manufacturing industry in billions of constant (2016) rand (a), year to June



Note: Deflated using indices for volume of production. Source: Calculated from Statistics South Africa. Manufacturing production and sales. Excel spreadsheet. Series on actual monthly sales and volume of production. Downloaded from www.statssa.gov.za in October 2016.

Employment changes in manufacturing by industry essentially tracked output. Food and beverages increased jobs from 300 000 to 350 000 from 2008 to 2015, then fell sharply with the drought. In contrast, employment in metals, metal products and machinery remained substantially lower in 2016 than in 2008.

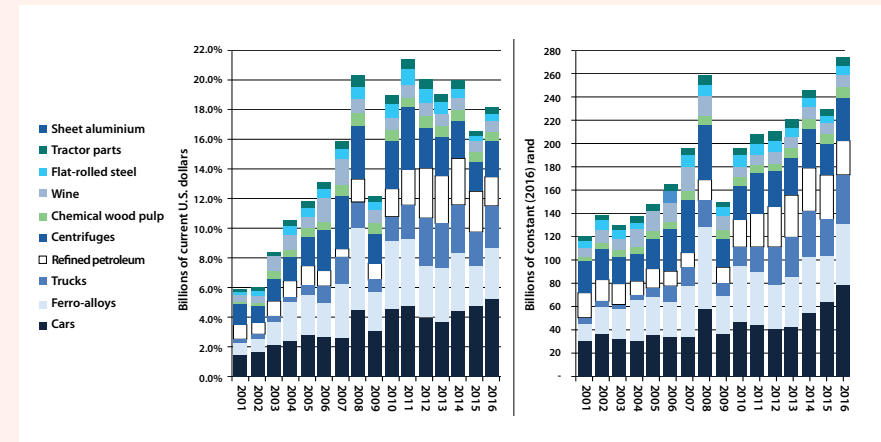
Graph 35. Employment by industry, 2008 to 2016 (a)



Note: (a) Average of quarterly figures for each year. Source: Calculated from Statistics South Africa. Quarterly Labour Force Surveys for relevant years. Electronic databases. Series on employment by industry. Downloaded from www.statssa.gov.za.

Autos, petrochemicals, machinery and equipment and food products contributed a rising share of South Africa's exports from 2011, in part because ores and metals lost ground and in part because of the boost provided by the more competitive rand. The top ten manufactures reflected these trends, dominated by cars, petrol, mining equipment and wine. In dollar terms, the value of these exports declined from 2011, after recovering from the sharp fall in 2008/9. In rand, they increased through 2014 but declined slightly in 2015.

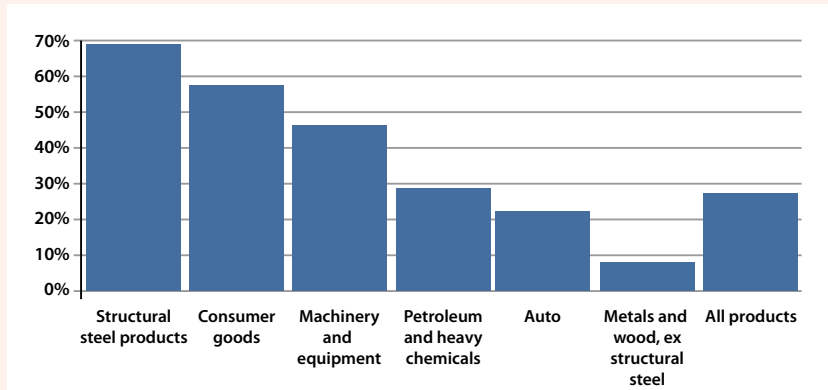
Graph 36. Exports of major manufactures in constant rand and dollars (a)



Note: (a) deflated with CPI. Source: Calculated from TradeMap. Electronic database. Series on South African exports at the HS4 cluster level. Downloaded from www.trademap.org in March 2017.

South African manufactured exports depended disproportionately on regional sales, in contrast to mining and agriculture, which largely focused on China and the global North. As the following graph shows, SADC accounted for over half of South African exports of structural steel, consumer goods and machinery and equipment, but only a fifth of autos and under a tenth of metals and wood products, excluding structural steel.

Graph 37. Share of major exports going to SADC, 2015



Source: Calculated from TradeMap. Electronic database. Series on South African exports at the HS4 and HS2 level. Downloaded from www.trademap.org in October 2016.

In sum, the end of the commodity boom had major implications for industrialisation. On the one hand, it slowed overall growth, which affected virtually all of manufacturing directly or indirectly. Slower growth also reduced the fiscal space for the state to support industrialisation. On the other, the end of the commodity boom opened up new opportunities thanks to a more competitive rand and increased pressure on producers and investor to find innovative projects. For IPAP, the challenge was to enable South African manufacturing companies to take advantage of these opportunities to drive industrialisation.

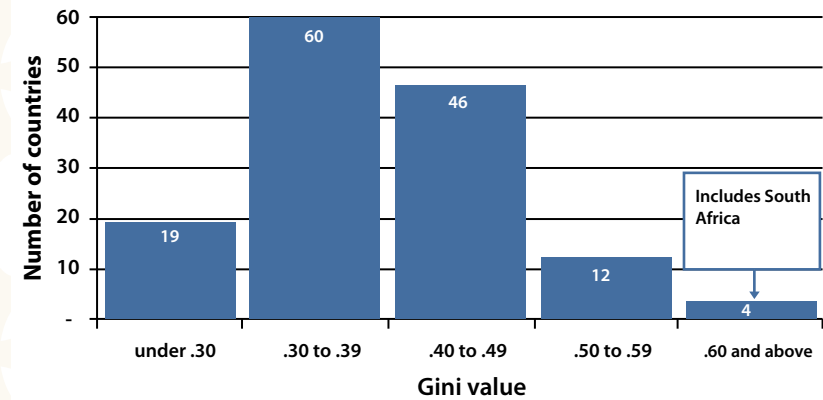
Inequality and manufacturing

South Africa ranked amongst the most unequal countries in the world in terms of both income and wealth. Moreover, it was located within an unusually inequitable region. These realities have major implications for industrial policy because they affect the nature of consumer demand, socio-economic and workplace uncertainty and conflict, and regional labour migration.

Estimates of the Gini coefficient – a higher Gini coefficient represents greater inequality – were above .60 for South Africa. As the following graph shows, that meant South Africa ranked amongst the most unequal countries in the world.

The distribution of wealth was even more unequal. The richest 10% of households account for over half of household income but held over 90% of household wealth.

Graph 38. Countries grouped by Gini range (a)



Note: (a) The dataset provides Gini estimates for 141 economies, dated between 2006 and 2014. Source: World Bank. World Development Indicators. Electronic dataset. Downloaded from www.worldbank.org in January 2017.

The southern African region was also unusually unequal by global standards, with the population split almost equally between low-income and upper-middle income economies.

In contrast, in Latin America and Asia three quarters of the population lived in upper-middle-income economies and less than a tenth in low-income countries. In the rest of Africa, almost half of the population lived in low-income economies, with most of the rest in lower-middle-income countries and only 6% in upper-middle-income countries.

The income gap between South Africa and its neighbours was much greater than for the other BRICS. South African's GDP per capita was almost eight times that of the rest of SADC. In contrast, the other BRICS had a GDP per capita between one and four times that of their neighbours.

Research by the IMF and others⁴ indicated that high levels of inequality are associated with slower economic growth. The principle ways that inequality prevented sustained economic development include the following.

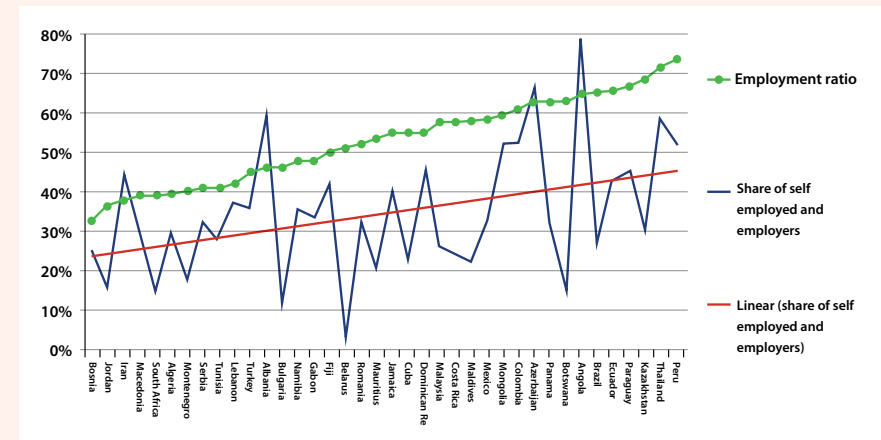
- Consumption is dominated by the high-income group, which limits the market for mass-produced goods and local generic products, while fostering imports and high-end services.
- Unequal societies cannot easily mobilise around developmental initiatives, while they are more likely to experience conflicts around ownership, taxes and wages. This situation in itself makes investors more uncertain. Moreover, when government provides incentives and support to businesses, however important for economic development and broad-based prosperity in the longer run, it can seem like unfair handouts to the rich. The challenge is particularly fraught in democracies and during periods of slower growth, when the trade-offs become sharper.
- Inequality in South Africa is associated with relatively concentrated ownership. This in turn fosters both financialisation and short-term time horizons for investors. In particular, many large companies argue that foreign acquisitions constitute an alternative to local investment.
- Economic and political challenges in South Africa's neighbours foster substantial in-migration of both skilled and unskilled workers. The increased pool of skilled workers should promote growth in South Africa, but inward immigration has a number of attendant challenges.

In short, to be sustainable, industrialisation must also bring about a more inclusive and equitable economy not only in South Africa but in the broader region. That in turn meant that it must address the factors that lead to the reproduction of national and regional inequalities. These factors included the following.

1. The apartheid system aimed in large part to generate low-cost labour for the mines and farms by eliminating small African farms and other businesses, leading to high joblessness. As Graph 39 shows, low levels of self-employment internationally are associated with relatively low levels of employment overall. Apartheid laws and practices also encouraged a hierarchical and oppressive work organisation and limited access to quality education and training. Despite significant progress, an unusually high level of joblessness and workplace inequality by international standards was reproduced after 1994 by disparities in the ownership of assets, education and infrastructure, and the lack of market institutions able to serve emerging enterprise.

⁴ See for instance Ostry et al. 2016

Graph 39. Employment ratio (a) compared to share of self-employed and employers in total employment in upper-middle-income economies (b)



Notes: (a) Share of employed in all working age adults. (b) Latest year from 2007 to 2013; most in 2010 to 2013. Source: World Bank. World Development Indicators. Electronic database. Series on wage and salaried workers, total (% of total employed) and employment to population ratio 15+, modelled ILO estimate. Downloaded from www.worldbank.org in June 2016.

2. At the regional level, colonial rule shaped unusually extreme commodity dependence, reinforced by the allocation of infrastructure. Although some SADC members made considerable progress toward diversification, economic development and regional integration were hindered by the continued capture of mining rents by foreign investors (including some South African companies) as well as local elites; inadequate investment to expand and maintain infrastructure; and often a high level of political and social contestation.

Manufacturing both reflects and contributes to the broader factors behind inequality in the economy as a whole.

As in the rest of the economy, most manufacturing industries are dominated by a relatively small number of large formal companies, with smaller producers under-represented compared to other countries. In 2015, there were around 650 000 formal employers and self-employed people. Of these, under 60 000 or 9% were in manufacturing. About half of all formal enterprises, and a third of those in manufacturing, were owned by Africans.

The number of small formal enterprises had remained virtually unchanged from 2005, although the share of African ownership had risen from a third⁵.

The level of concentration in manufacturing is graphically illustrated by the agro-processing value chain. In most countries, food production and sale is labour intensive and dominated by small enterprises. In South Africa, in contrast, it largely falls to a few formal conglomerates.

The concentration of manufacturing under a few major companies, and the limited size and representivity of smaller enterprises, reflects several structural factors.

To start with, South African manufacturing was historically dominated by the mining value chain - in particular, beneficiation of metals, coal and some capital goods production. These kinds of production are relatively capital and energy intensive. As noted above, the metals refineries were historically the largest industry in manufacturing, although they lost ground after 2008.

In the rest of manufacturing, relatively high barriers to entry for small producers persist. In particular, emerging suppliers face limited access to skills, infrastructure (especially in historically African communities), credit and marketing networks. As with any infant industry, institutions and support systems to make up the gaps could be built over time, but in the short run their lack raises the risk and depresses profitability for smaller producers.

In addition to relatively high concentration, the available evidence suggests that, compared to the rest of the world, South African manufacturing has unusually deep inequalities in remuneration and high levels of workplace conflict.

As Graph 40 shows, the ratio between pay for the 90th and 10th decile in manufacturing was 23 to one in 2014. That was the second highest figure of any industry in South Africa, and around twice the international norm. According to the Labour Market Dynamics survey, in 2014 the median income for employees in formal manufacturing was R4000, compared to earnings of R10 000 for all formal entrepreneurs. Obviously, the discrepancy was far greater in large companies.

Graph 40. Ratio of top to bottom decile in wages by industry, 2014



Source: Calculated from Statistics South Africa. Labour Market Dynamics 2014. Series on earnings of employees and of employers and the self-employed. Electronic database downloaded from www.statssa.gov.za in January 2016.

According to the Department of Labour⁶, in 2014 manufacturing saw 200 days on strike for every thousand workers, although only around 26 000 workers went on strike. That was second only to mining. The figure for 2013 was not much lower. While these rates were far smaller than the strike waves of the late 1980s and early 1990s, they point to the depth of the social and economic gap between managers and employees. Overall, according to the World Economic Forum's Global Competitiveness Report, managers and experts ranked South Africa consistently in the worst five countries in the world in terms of workplace conflict.

The persistence of exclusion in manufacturing points to the importance of IPAP's commitment to more inclusive, job-creating industrialisation. Key elements include the following.

⁵ Figures are calculated from Statistics South Africa. Labour Market Dynamics 2015 and Labour Force Survey September 2005. Series on type of employment in the private sector. Electronic databases downloaded from www.statssa.gov.za in January 2016.
⁶ Department of Labour. Annual Industrial Action Report 2014. Pretoria. Pages 10-11.

1. Industrialisation requires support for smaller producers and more competitive industries in manufacturing. Achieving that aim means both sustaining existing entrepreneurs and reducing barriers to entry for potential new small business and industrialists. That in turn necessitates innovative market institutions that can make up for gaps in mentoring, skilling, business services, credit and marketing support. A wide variety of agencies and organisations could meet these needs, including incubators and clusters as well as state agencies and large companies. Strengthening and expanding these kinds of institution would enable emerging enterprises to make effective use of investment finance, training and new infrastructure.

IPAP is committed to supporting black industrialists rather than merely transferring ownership in existing large companies to empowered individuals without any real change in decision making and control. At the same time, employee ownership schemes could help to broaden ownership and the benefits from growth while mobilising greater support for enterprise development. Achieving both these aims requires a closer alignment of broad-based BEE requirements, above all by continually strengthening support for local procurement.

2. In terms of job creation, the direct impact of industrialisation through manufacturing employment is not as significant as the indirect effects. Manufacturing and value-added services promote job creation in several ways:
 - First and foremost, they support a stable, relatively well-paid workforce that in turn provides a core market for consumer goods and services.
 - Beneficiation generates demand for mining and agricultural products. Farming in particular is a critical area for improving rural livelihoods on a large scale.
 - Manufacturing and value-adding services such as tourism and software production provide important export products, which in turn help sustain overall economic growth.
 - Manufacturing supports and sustains investment into logistics and related infrastructure.

Because of these realities, industrial policy measures should directly support indirect and induced job creation from manufacturing investments, rather than assuming it will follow automatically.

3. Mobilising workers to support industrialisation would also require more equitable and inclusive workplaces. The paradigms set in the past need to be overcome through changes in communication and management practices and in work organisation. Building a skilled, productive and dynamic workforce requires addressing many of the lingering issues from the past, which include discriminatory and arbitrary decision making, unequal facilities and a pervasive lack of trust. In the longer run, organisational development requires that staff have career mobility and pay progression, including for lower-skilled workers.
4. Finally, more inclusive industrialisation requires more supportive education and training systems.

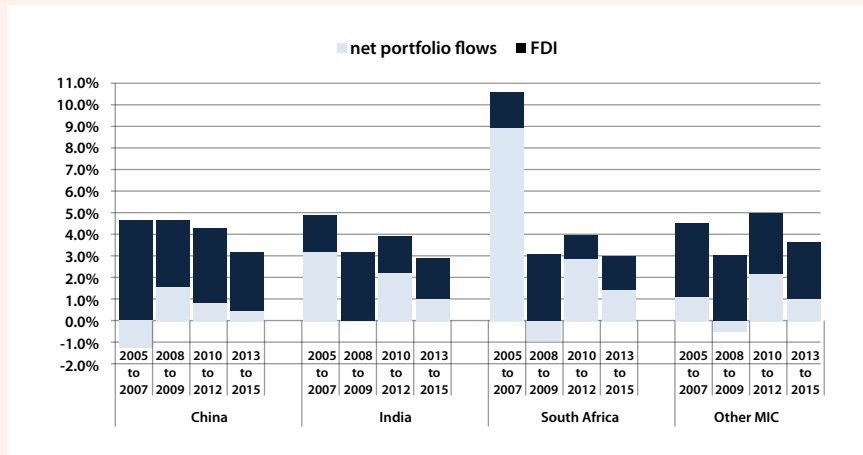
It is particularly important to identify more clearly what employers need from secondary school leavers and matrics. In 2014, over half of employed people in formal manufacturing had matric and almost one in five had a degree. That was almost the same as other private formal workers. But employers often argue that the skills learned in most secondary schools are inadequate, especially in terms of competency in English (as the language of the economy), as well as in accounting, basic maths, computer literacy, problem solving and teamwork. It is no longer enough to focus only on remedying deficits in basic education through post-school training.

Financialisation in South Africa

Financialisation in South Africa, in the sense of unusually large financial markets and flows compared to the size of the economy, is particularly pronounced compared to peer economies. In many ways, the South African financial sector resembles off-shore financial centres that facilitated speculative flows that were largely unrelated to the needs of the local economy. This situation affects industrial policy in four ways – by diverting skills and resources from productive investment, by promoting short-term portfolio holdings over direct investment for both domestic and foreign investors, by fostering asset bubbles, and by supporting the overvaluation and volatility of the rand.

From 2005 to 2007, South Africa averaged 22% of net capital portfolio flows to middle-income economies. In this period, net portfolio investment into South Africa averaged over US\$11 billion a year. From 2013 to 2015, following great volatility during the global financial crisis, the figure settled down at around US\$5 billion.

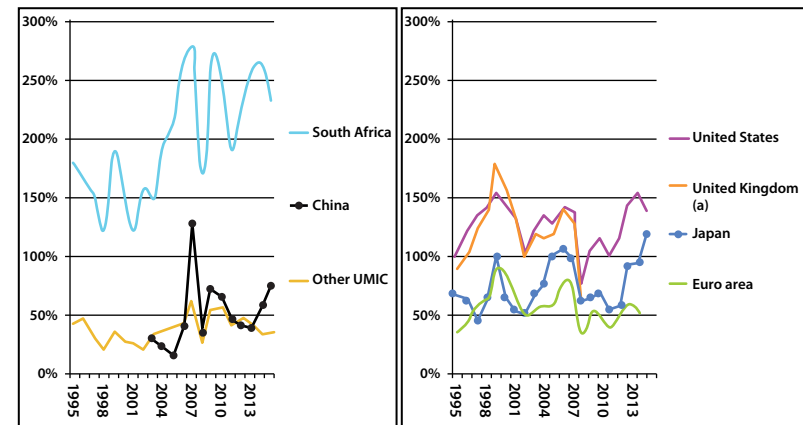
Graph 41. Net portfolio flows and direct investment inflows as percentage of GDP for selected middle-income economies



Source: World Bank. World Development Indicators. Electronic database. Series on foreign direct inflows as percentage of GDP and net portfolio investment as percentage of GDP. Downloaded from www.worldbank.org in January 2017.

The inflow of portfolio investment helped fuel a rapid increase in the value of the South African stock market, which outstripped both its peers and industrialised countries relative to the GDP.

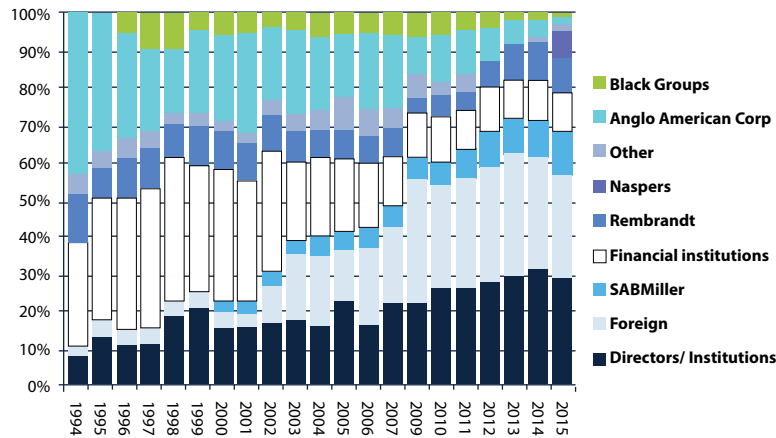
Graph 42. Market capitalisation as percentage of GDP, selected economies



Note: (a) Source does not provide data for the U.K. after 2008. Source: Calculated from World Bank. World Development Indicators. Electronic database. Series on market capitalisation as percentage of GDP. Downloaded from www.worldbank.org in January 2017.

The rising valuation of the stock market was driven largely by foreign institutional investment, with a focus on mining companies. The share of foreign investment in shares climbed from 2% in 1994 to 33% in 2013, but fell back to 27% in 2015.

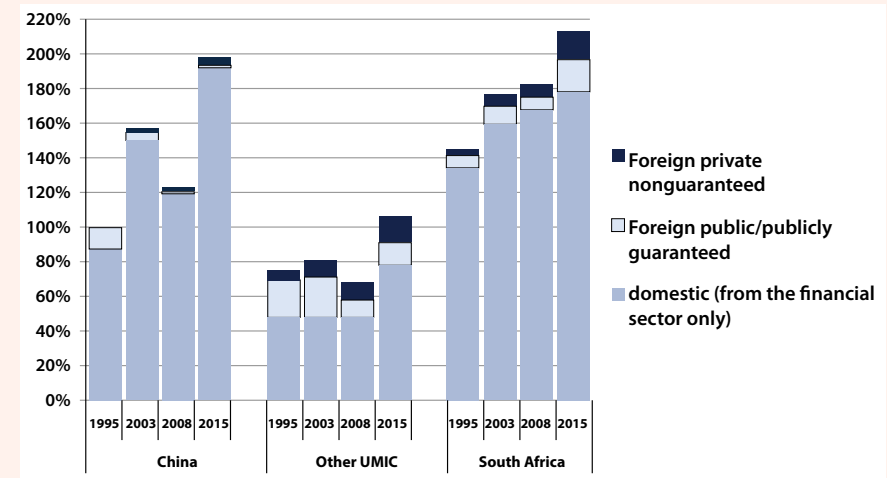
Graph 43. Ownership of the stock exchange, 1994 to 2015



Source: Data provided by Who Owns Whom, Johannesburg, in July 2016.

Financialisation also emerged in soaring domestic lending. From 2003 to 2008, the value of domestic debt relative to GDP tended to decline in other upper-middle-income economies, including China. In contrast, in South Africa it started relatively high and continued higher. External debt was smaller than domestic lending, but its growth accelerated in South Africa and other upper-middle-income economies after the global financial crisis.

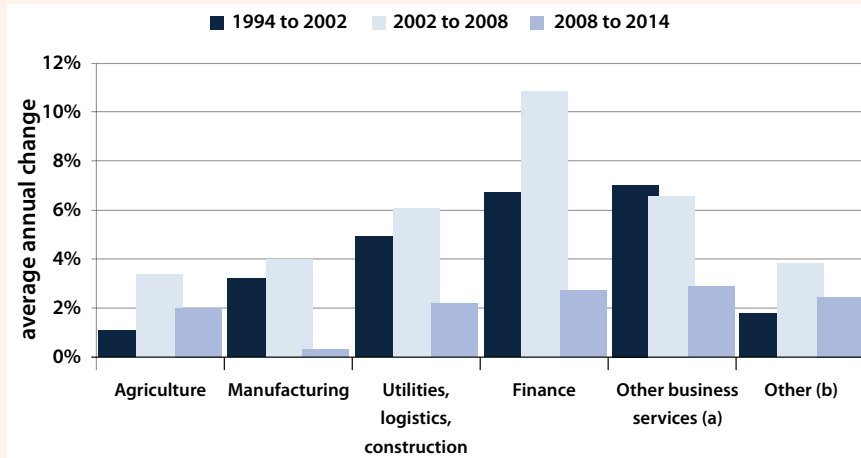
Graph 44. Stock of external debt to private borrowers and to public and publicly guaranteed entities, and domestic debt owed to financial sector, as percentage of GDP



Source: Calculated from World Bank. World Development Indicators. Electronic database. Series on external debt stock by type of borrower, domestic credit provided by the financial sector, and GDP in constant U.S. dollars. Downloaded from www.worldbank.org in January 2017.

The expansion of financial markets was associated with relatively fast growth in the financial sector compared to the rest of the economy. The financial sector grew particularly quickly in the years just before the 2008/9 global financial crisis. From then until 2014 – the latest available data – it slowed down.

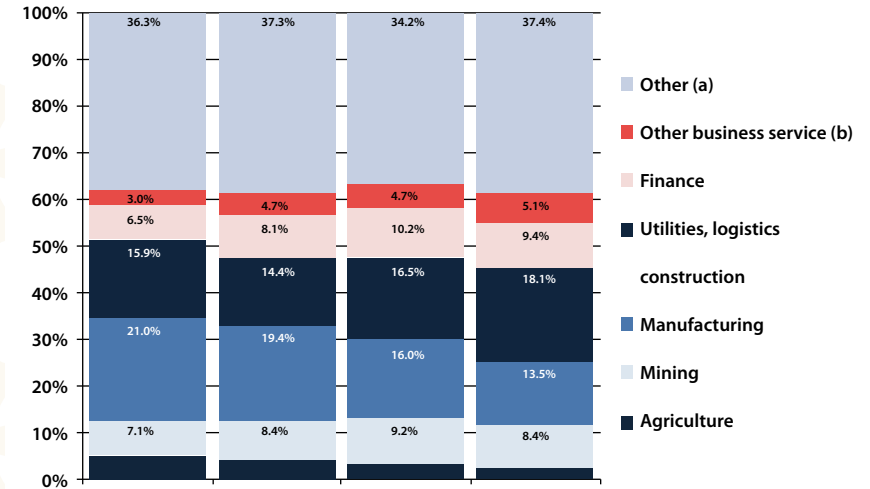
Graph 45. Average annual growth by sector, 1994 to 2014 (a)



Notes: (a) Mining is excluded because the figures in volume terms do not adequately reflect the relatively rapid increase in the value of production compared to other sectors. (b) Excludes real estate. (c) Government services, trade, personal services and real estate. Source: Calculated from Statistics South Africa. GDP P0441 Q3 2016. Excel spreadsheet. Table 10. Downloaded from www.statssa.gov.za in December 2017.

Because of its relatively rapid growth, the financial sector grew proportionally from 14% of total value-added in 2002 to 18% in 2014. Other business services also expanded their share of value added in this period. In contrast, the share of manufacturing and agriculture declined while the share of mining remained almost unchanged.

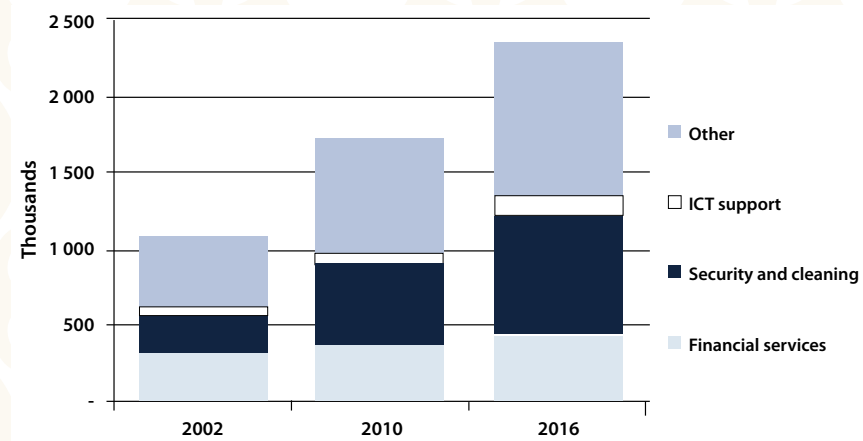
Graph 46. Share of total value added by industry, 1994 to 2014



Notes: (a) Government services, trade, personal services and real estate. (b) Excludes real estate. Source: Calculated from Statistics South Africa. GDP P0441 Q3 2016. Excel spreadsheet. Table 10. Downloaded from www.statssa.gov.za in December 2017.

Despite its relatively rapid growth, the financial sector did not create many jobs directly. The data are often misunderstood because Statistics South Africa combined finance with other business services and shortened the name of the sector to financial services. Financial sector employment came to just 18% of total business service employment in the third quarter of 2016, down from 22% in 2010 and 30% 2002. From 2002 to 2016, employment in the financial sector grew by a total of 34%, compared to 152% a year for other business services. In the same period, protective and cleaning services climbed from 23% of total business service employment to 33%.

Graph 47. Employment in the financial sector and other business services, September 2002 and third quarter 2010 and 2016



Source: Calculated from Statistics South Africa. Labour Force Survey September 2002 and Quarterly Labour Force Survey, third quarter, 2010 and 2016. Electronic databases. Series on employment by industry and occupation. Downloaded from www.statssa.gov.za in January 2017.

Some 33% of financial workers in 2016 were white, compared to 12% in the rest of employment. The share of whites in the industry had fallen from 48% in 2002.

In sum, while strong financial services are critical for economic efficiency and productivity, the extraordinary expansion in financial services and inflation in financial assets especially during the commodity boom indicated some risks for industrialisation. In particular, they were associated with speculative asset bubbles, volatility in the value of the rand, and a concentration of skills and capacity on managing financial transactions rather than the real economy.

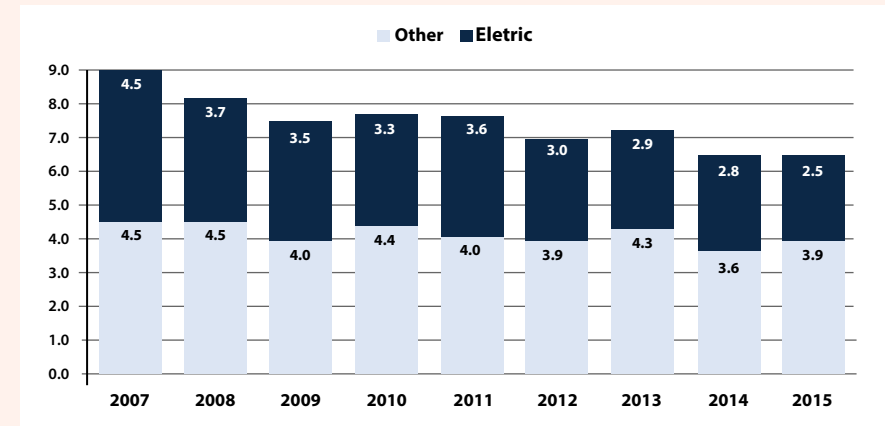
The national build programme and manufacturing

From around 2005, the state committed to enhancing economic infrastructure, especially bulk transport, electricity and water. Many of the major new projects supported expanding mining and depended on mining revenues for success. As Graph 33 above noted, the increase in spending paralleled the mining boom, but higher levels of public investment persisted even after metals prices crashed. The infrastructure programme supports industrialisation in two ways: by improving efficiency across the economy, and by increasing demand for capital goods.

While upgrading of infrastructure was critical to maintain growth, a challenge arose around designing projects to ensure that the cost of improved infrastructure did not outweigh the benefits. This challenge sharpened with the decline in metals prices, which meant that demand from mining for infrastructure might fall short of the expected levels.

The trade-off emerged primarily in terms of the level of user fees. In the case of electricity, for instance, the unit cost more than doubled in real terms from 2008 to 2016. One result was a sharp decline in electricity-based steel production, which resulted in the loss of around a third of steel capacity from 2008 to 2016.

Graph 48. Production by electric and oxygen refineries



Source: Calculated from, South African Iron and Steel Institute. Crude steel production. Data in Excel format. Downloaded from www.saisi.co.za in May 2016.

A further challenge arose around municipal infrastructure. Under the Constitution, municipalities supplied electricity, water and transport facilities to most producers, although the mines were generally able to arrange direct supply from bulk suppliers. For many municipalities, these services were a key source of revenue. They often used it, however, to redress the historic underinvestment in public services in black communities and townships, while allowing older systems to deteriorate. In many areas, in recent years this strategy resulted in relatively frequent outages in electricity as well as worse quality roads and water.

In addition, municipalities often do not have capacity to provide infrastructure rapidly to new plants. That in turn makes production and investment more difficult, in some cases threatening hundreds of jobs. Improvements are, however, hard to achieve because of the cost of recapitalising run-down systems as well as the lack of technical capacity in many municipalities.

Finally, infrastructure systems remain largely geared to promoting mining exports, sometimes effectively at the cost of manufacturing. For instance, dedicated lines to the coast as well as specialised port handling facilities help maintain competitiveness for iron ore and coal. But their efficiencies are often not passed on to domestic consumers, who generally pay higher tariffs for inland transport.

The infrastructure programme could also promote industrialisation by providing for local procurement of capital goods. In the event, as of 2017 major technologies were designated for local procurement, including rolling stock, structural steel and inputs for windmills for power generation.

Climate change and South African manufacturing

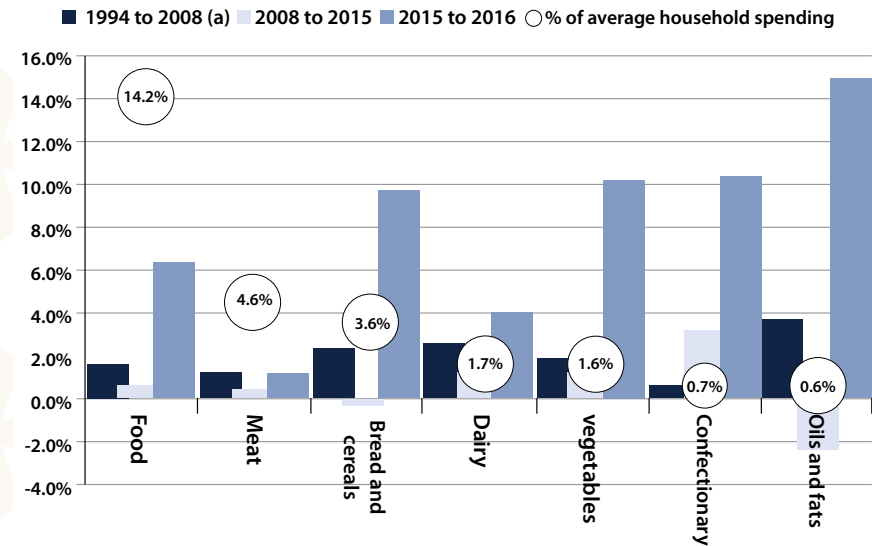
For South African manufacturing, the main risks from climate change emerge from the potential destabilisation of agriculture and the coal value chain. Opportunities arise primarily in providing technologies for alternative energy generation, energy saving in production and households, and to shift away from water-intensive and rain-fed agriculture.

The 2015/6 drought in southern Africa saw the lowest rainfall in over a century. Forecasts suggest that an alternation between heat waves and heavier rain would likely become more common in the future.

These patterns are particularly important for food production, which formed a mainstay of growth in manufacturing since 2008. The industry was, however, significantly affected by the drought, with slowing growth in sales and significant job losses.

The drought also had an impact on manufacturing overall by raising the cost of food, putting pressure on wages. Unprocessed food prices rose 10,4% from mid-2015 to mid-2016 and processed food rose 12,5%. That compared to a 5,2% increase in prices of other products. As a result, inflation for households in the poorest quintile climbed by 8% from October 2015 to September 2016, compared to only 6% for the richest quintile.

Graph 49. Average annual real increase (a) in price for different food groups in the year to July



Note: (a) Increase in price less CPI. Source: Calculated from Statistics South Africa. CPI (COICOP) from January 2008 (201609). Excel spreadsheet. Figures for July of relevant years. Downloaded from www.statssa.gov.za in October 2016.

Climate change also had implications for the coal value chain, which is fundamental to South African manufacturing through its importance for electricity generation and for Sasol’s petrochemical plants. As climate change progresses, it is likely that:

- national and foreign carbon taxes could raise the cost of coal consumption, and
- in order to reach agreed-on targets for greenhouse gas emissions, there could be pressure to ration coal use if pricing systems fail.

These measures would affect manufacturing both by increasing the cost of electricity and by affecting the viability of coal-dependent petrochemicals.

Adapting to and mitigating the costs of climate change also offers opportunities for manufacturing. These opportunities revolve primarily around the introduction of new, more environmentally friendly technologies. They include the following.

- Inputs into alternative energy production. The state aims to procure key wind and solar technologies from local producers.

- Replacement of coal with gas where possible. Sasol began to shift to gas from Mozambique, and Eskom was initiating gas-based generation. These projects required both long-distance pipelines and extraction equipment, as well as technologies to utilise gas more widely.
- Products to support adaptation in farming to the combination of droughts and heavy rainfall. A critical requirement was broader diffusion of water-saving irrigation techniques.
- Support for public and non-motor transport to limit emissions from both public and freight transport.

More broadly, a shift away from coal-based and energy-intensive production opened opportunities in other industries. In effect, together with the end of the commodity boom, climate change is compelling a shift in South Africa's historic dependence on mining-based exports. That shift will necessarily impose significant costs, but it seems unavoidable. The challenge is to minimise the costs while identifying new areas for growth.

For industrial policy, the critical challenges arising from climate change can be summarised as follows.

1. The costs of adapting to and limiting climate change should be minimised as far as possible. That requires above all efforts:
 - a. To improve information flows about new opportunities;
 - b. To facilitate the shift of resources into new areas of production, for instance by providing appropriate infrastructure, retraining for workers and entrepreneurs, and supplying initial finance;
 - c. To phase in changes to the cost of energy so as to enable companies to adapt rather than simply closing down; and
 - d. To continue with support to companies to enable them to invest in energy saving technologies.
2. As far as possible, the costs of the transition should not be shifted to working people and poor communities, and the benefits should be spread broadly. Achieving this aim requires the following, amongst others:
 - a. Pro-active responses to job losses for both workers and their communities;
 - b. Efforts to promote new suppliers for new technologies; and
 - c. Targeted assistance for community-based technologies such as clean stoves and solar water heaters that both benefit poor households and can be produced, repaired or installed by small and micro entrepreneurs.

Implications for IPAP

Like many of its middle-income peers, South Africa is faced by complex and fast-moving demands requiring fundamental economic transformations and transitions. They include adjusting to the end of the metals price boom; factoring in the gathering impacts of climate change and the looming challenges of the fourth industrial revolution; and, critically, grappling with profound domestic socio-economic inequality. The structural and systemic fault-lines in the South African economy have on the one hand caused slower and more fragile growth in manufacturing overall. On the other, they have contributed to a structural shift away from metals refining toward other sectors, especially auto and agro-processing.

IPAP responds to these challenges in the following ways:

First: it has long sought to enhance the contribution of manufacturing to a more inclusive economy both by promoting black industrialists and small business and by encouraging job creation both directly and indirectly. In this context, over and above the support to large, lead and dynamic firms, greater attention will be paid to providing holistic support to emerging enterprises and to concrete measures to maximise the indirect employment benefits of industrialisation.

Second: IPAP recognises that industrialisation is critical for diversifying away from commodity dependence. (There is surely, by now, a sufficient international consensus to make this a “no-brainer”). The challenge under current conditions is to take advantage of the end of the metals price boom to promote new industries and activities that are more sustainable, promote higher value add and encourage employment creation.

Third: regional development represents an increasingly important thrust. The development of integrated regional value chains opens opportunities for industrialisation across the region, including South Africa. The challenge is to develop practical measures to support collaboration based on a fair division of labour. A critical step is to reduce the cost of logistics (including regulatory delays and fees) while at the same time ramping up transport and communications infrastructure.

Fourth: IPAP has clearly recognised the necessity to respond proactively to the massive shifts in technology – the fourth industrial revolution – indicated by digitisation, the internet of things and big data capabilities.

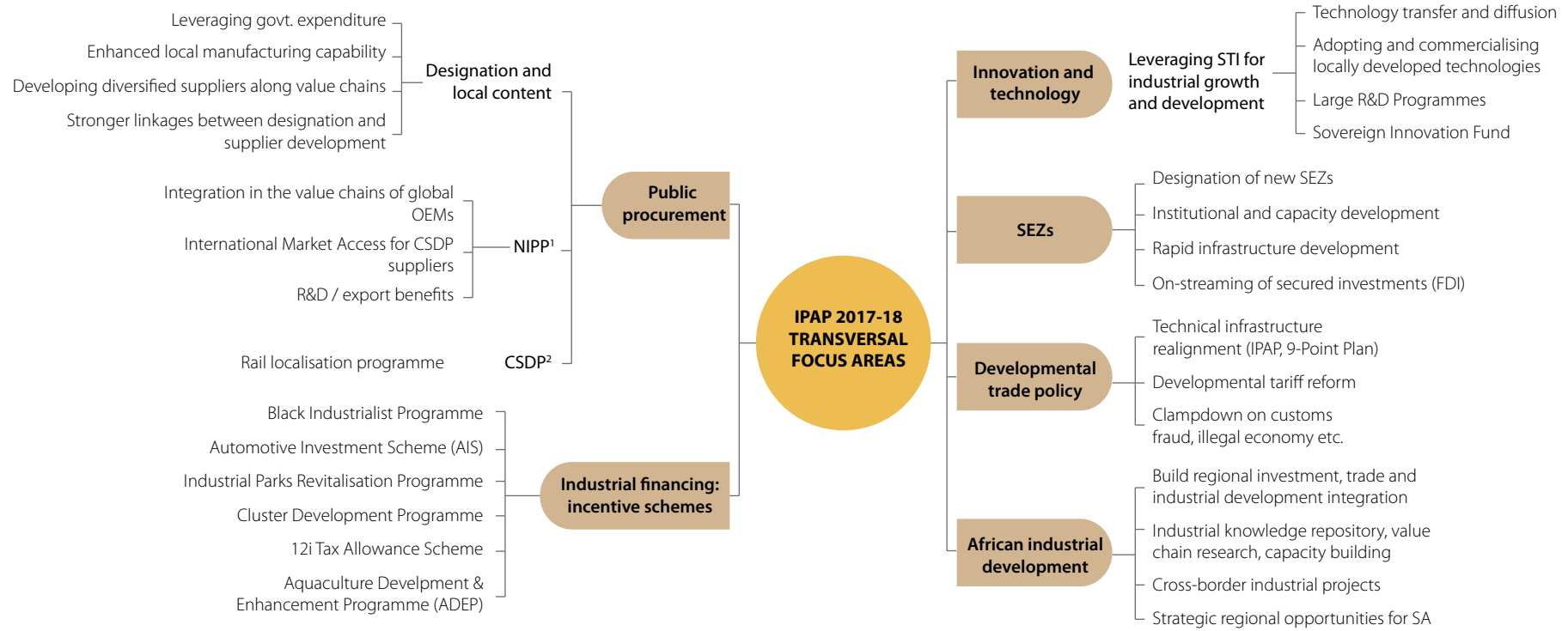
Finally: fiscal constraints and slow growth make it even more imperative that IPAP measures draw on all possible state levers based on clear priorities, consistency, and strong alignment across the state.

Every state action and communication should be tested, in part, on its impact on inclusive growth in both the short and long run. Critically, promoting domestic investment requires certainty around ownership and regulations, without unnecessary changes or reforms.

In addition, industrial policy must be able to draw on all core state functions, including the provision of infrastructure, education and regulatory frameworks and standards. Where opportunities arise for growth, enterprises should be assured of a package of efficient and effective support from state agencies.

SECTOR DESK REPORTS AND KEY ACTION PROGRAMMES

IPAP 2017/18 – 2019/20: TRANSVERSAL FOCUS AREAS



¹National Industrial Participation Programme

²Competitive Supplier Development Programme

1. Public procurement

Situational analysis

Procurement of locally manufactured products is one of the key levers identified by the government to support industrial development in South Africa. The amended regulations to the Preferential Procurement Policy Framework (PPPFA) Act 5 of 2000, promulgated in June 2011, came into operation on 7 December 2011, empowering the Department of Trade Industry (the dti) to designate products, sectors and sub-sectors for local production with stipulated minimum thresholds for local production.

Local procurement is one of the central pillars of the Industrial Policy Action Plan (IPAP). It leverages public expenditure for industrial development amid a host of competing economic challenges facing South Africa. The key aims are to minimise import leakages (which represent an outflow from the fiscus) whilst at the same time attempting to increase both aggregate demand and supply in the South African economy.



Regulation 9(1) of the PPPFA amended regulations requires that all relevant organs of state⁷ purchase only locally produced products at a prescribed level of local content.

For each designated product, except pharmaceutical products, instruction notes are issued by National Treasury, which regulate the environment within which government departments and public entities may procure designated products.

Nineteen sectors have so far been designated for local production with minimum local content thresholds, (see Table 1 below). In terms of the local content rules - in particular, the adjudication and awarding of tenders designated for local production - the first qualifying threshold that must be achieved by bidders is local manufacturing of the products/commodities to be supplied; no points are awarded for this.

⁷ As contemplated in section 1 (iii) of the PPPFA; all public entities listed in Schedules 2, 3A, 3B, 3C and 3D of the Public Finance Management Act (PFMA); and all municipal entities.

If bidders meet the threshold for local production, then their bids will be considered further and evaluated on the price and preferential points. Other procurement levers do not have this requirement and all tenders not designated for local production are evaluated based on functionality, price and preferential points as required by the PPPFA.

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

#	Sectors already designated * Category/description	Designation date	Minimum local content thresholds
1.	Rail rolling stock	16-07-2012	
	Diesel locomotives		55%
	Electric locomotives		60%
	Electric multiple units		65%
	Wagons		80%
2.	Bus bodies	16-07-2012	
	4x2 Commuter bus, 36-seater and more		80%
	6x2 Commuter bus, 56-seater and more		80%
	4x2 City bus, 21-seater and more		70%
	6x2 City bus, 50-seater and more		70%
	6x2 Semi-luxury coach, 50-seater and more		70%
3.	Canned/processed vegetables	16-07-2012	80%
4.	Clothing, textiles, leather & footwear sector	16-07-2012	100%
5.	Solar water heaters (tank & collector)	19-07-2012	70%
6.	Set-top boxes	26-09-2012	80%
7.	Certain pharmaceutical products **	07-11-2012	Per tender
8.	Furniture products	15-11-2012	
	Office furniture		85%
	School furniture		100%
	Bases and mattresses		100%
9.	Electrical and telecom cables	08-05-2013	90%
10.	Valves and actuators	06-02-2014	70%
11.	Working vessels	01-08-2014	60%

* Instruction notes already circulated by National Treasury

** Local content thresholds for pharmaceutical products are set per tender, based on the availability of active pharmaceutical ingredients (APIs)

#	Sectors already designated * Category/description	Designation date	Minimum local content thresholds
12.	Residential electricity meters	01-08-2014	
	Pre-paid		70%
	Post-paid		70%
	Smart		50%
13.	Steel conveyance pipes	28-09-2015	
	Spiral submerged arc welding (bare)		100%
	Spiral submerged arc welding (galvanised)		100%
	Spiral submerged arc welding (lined and coated)		80%
	Spiral submerged arc welding (galvanised, lined and coated)		80%
14.	Powerline hardware and structures	28-09-2015	100%
15.	Transformers	28-09-2015	
	Class 0		90%
	Class 1		70%
	Class 2		70%
	Class 3		45%
	Class 4		10%
16.	Two-way radios	30-06-2016	
	Portable radio		60%
	Mobile radio		60%
	Repeater		60%
17.	Solar PV components	30-06-2016	
	Laminated PV modules		15%
	Module frames		65%
	DC combiner boxes		65%
	Mounting structure		90%
	Inverter		40%
18.	Rail signalling system	30-06-2016	65%
19.	Wheelie-bins	18-08-2016	100%

Progress highlights on designated industries and sectors

In the designation process, there is a requirement that all suppliers meet the set minimum thresholds for local content when they are tendering for goods, works and service contracts within the public sector. These thresholds - and that local production takes place within the borders of South Africa - must be verified by the South African Bureau of Standards (SABS) only after tenders have awarded to successful bidder(s).

Table 2 shows that as from March 2015 to July 2016, more than R57 bn has been locked into the country because of local content requirements; mainly because of the rail rolling stock fleet procurement.

Note, however, that only 4% of the monetary value of tenders designated for local production was verified.

Table 2 : Monetary value of tenders designated for local production: Mar 2015-Jul 2016

DESIGNATED PRODUCTS	Signed standard bidding documents submitted to the dti	Total value per sector (R million)	No. of companies verified	Tender value verified	% Verified (Total value/ over tenders verified)
Textiles	183	1,136,921	2	624,417	55%
Office furniture	59	220,494	-	-	-
Electrical cables	18	1,003,743	3	588,535	59%
Canned veg	5	2008	-	-	-
Valves	2	701	-	-	-
Rolling stock	4	49,547,226	-	-	-
Set-top boxes *	1	4,300,000	3	600,000	14%
Power pylons	3	740,212	3	740,212	100%
Solar heaters **	1	-	3	-	-
Others	10	105,523	-	-	-
TOTAL	286	57,056,828	14	2,553,164	4%

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

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

Source: dti and SARS; local content databases, 2016

The PPPFA and designated products

The Industrial Policy Action Plan has put significant emphasis on leveraging public procurement for domestic manufacturing and the creation of jobs. The amended regulations of the Preferential Procurement Policy Framework Act (PPPFA) - which came into effect in December 2011 – empower **the dti** to designate sectors/products for local procurement with prescribed local content minimum thresholds.

So far about 21 sectors/sub-sectors/products are designated for local procurement. The designation of these sectors/products for local production and content was done in accordance with Section 9. (1) of the amended PPPFA Regulations.

The PPPFA Regulations require that organs of state *must specify local content requirements in the advertisement of tenders designated for local production and also consider local content in the adjudication of bids.*

This requirement is now an annual audited function for all affected Departments and entities.

Continuous use of Regulation 9.3 of the PPPFA Regulations to support local procurement of non-designated products

Regulation 9.3 of the PPPFA Regulations facilitates local procurement of non-designated and/or yet to be designated products/commodities. It has been used successfully for local production in the procurement of pipes, digital terrestrial antennas, manganese handling equipment, luggage trolleys and transformers (before they were designated). This is an important instrument in achieving the local procurement target of 75%.

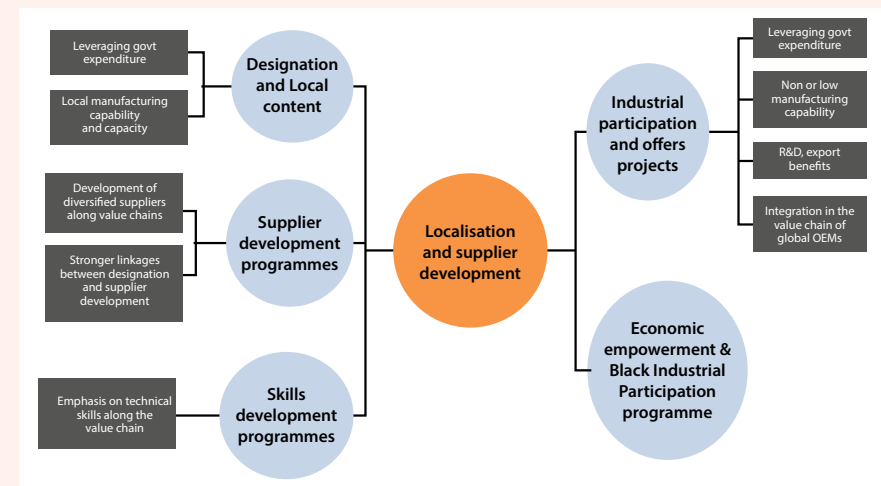
The **dti** has made submissions both in the PPPFA Draft Regulations and Public Procurement Bill that a clause dealing with local procurement of non-designated and/or yet to be designated products/commodities be retained. Directives for the usage of Regulation 9.3 by procuring entities are still to be issued by National Treasury, after further consultation with **the dti**. The Department has forwarded the National Treasury draft guidelines for the local procurement of non-designated products as required by Regulation 9.3.

Further work

While the foregoing discussion has described the array of procurement instruments currently available to support industrial procurement, it must be noted that many of these levers are not sufficiently aligned to fully complement one another. The key instruments in question are:

- Local content/designation;
- The Competitive Supplier Development Program (CSDP);
- The National Industrial Participation Program (NIPP);
- The Defence Industry Participation Program (DIPP);
- The Renewable Energy Independent Power Producer Programme (REIPPP); and
- The Local Procurement Accord (see Figure 1 below).

Figure 1: Localisation and supplier development linkages



Procurement levers must be continuously redesigned to more fully develop national industries, encourage research and scientific development and foster economic transformation.

Key Action Programmes

1. Consolidation of public procurement framework and reforms

Nature and purpose of the intervention

As discussed above, there is an urgent need to consolidate different statutes, regulatory frameworks and organs of state dealing with public procurement. The plethora of Acts, regulations and institutions makes it very difficult to measure the on-the-ground success or failure of procurement to achieve its industrial development goals.

Equally important is the need to minimise corruption and properly facilitate Broad-Based Black Economic Empowerment (B-BBEE) in government contracts.

The following are **the dti's** key focus areas in securing effective procurement reforms:

- **Alignment of the PPPFA Regulations to the B-BBEE Codes of Good Practice**

In both the PPPFA Draft Regulations and Public Procurement Bill, **the dti** calls for a stronger alignment to the B-BBEE policy, amended Codes of Good Practice and categorisation thresholds.

The Amended Codes of Good Practice make provision for the purchasing of goods and services from specific categories of companies ranging from Exempted Micro Enterprises (EMEs) to Qualifying Small Enterprises (QSEs) and Corporates. The relevant thresholds are determined using the revenue of the organisation as a reference point.

Through procurement it further stimulates the support of EMEs and QSEs that are 100% black owned, 51% black owned, or more than 51% black owned entities. This is advanced through Supplier and Enterprise Development initiatives.

- **Compliance on local content regulations**

In terms of the current PPPFA regulations, **the dti** has powers to designate sectors, but no powers to punish non-compliance.

Section 13 of the current PPPFA Regulations states:

13. (1) An organ of state must, upon detecting that:
 - (a) the B-BBEE status level of contribution has been claimed or obtained on a fraudulent basis; or
 - (b) any of the conditions of the contract have not been fulfilled, act against the tenderer or person awarded the contract.

The **dti** proposes that in dealing with non-compliance on local content, a new sub-section 13(c) be added, specifically addressing remedial actions to be applied in cases of non-compliance with local content conditions.

The sub-section must be written in peremptory (obligatory) terms, requiring 100% compliance.

- **Additional Procurement Levers to be included in the Public Procurement Act**
Even though they are a requirement in procurement expenditures, Offset Programmes are not included in procurement legislation and regulations.

The programmes in question are the National Industrial Participation Programme (NIPP), the Defence Industry Participation Programme (DIPP) and the Competitive Supplier Development Programme (CSDP).

None of these have any clear-cut legislative mandate and/or instruments for implementation. The draft Bill must therefore *provide clear-cut instruments to enforce compliance by organs of state in the specification, advertising, evaluation, adjudication and awarding of tenders aimed at leveraging industrial development.*

- **Funding options for the cost of local content verification**

As noted earlier, 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 must be verified by the SABS after tenders have awarded to the successful bidder(s).

The challenge, however, is that it is not clear *who pays for the cost of verification and how*. Successful bidders are refusing to pay for verification because there is no requirement in the procurement system for them to do so. The risk is that procurement is happening without the products being verified for local production by the SABS.

One approach would be to amend Bidding Documents and make the cost of verification a condition of the bid. This would be transparent and could be capped.

The other approach is a direct fiscal transfer to the SABS to carry out this function. This option would remove the administrative cost of funding verification from bidders and procuring authorities. Through this option the SABS could be required to prioritise awarded tenders based on their volumes and value.

Whichever route is taken, the state will have to carry the cost of verification - whether through the bidding documents option or through fiscal transfers.

Key milestones

2017/18 Q1-Q4: Finalise and submit the review of the technical specification of the calculation and measurement of local content.

2017/18 Q1-Q2: Carry out a sectoral review of the rail localisation programme.

2017/18 Q1-Q4: Participation in the public procurement reforms (PPPFA Draft Regulations and Public Procurement Bill).

Lead departments/agencies: the dti, SABS, TIPS

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

2. Designation of further sectors for local procurement

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 designation in the metal fabrication, capital equipment and transport equipment sector.
- Create scope for further localisation of manufacturing in the green industries brought about by investments in the renewable energy generation programme.

Key milestones

2017/18 Q1-Q4: Review of research work done by Sector Desks for further designation of sectors/sub-sectors for local procurement.

2017/18 Q1-Q4: Issue procurement instruction notes for designated sectors.

2017/18 Q1-Q4: Work with the Presidential Infrastructure Coordinating Commission and Industry Associations to identify opportunities for further designation.

2017/18 Q1-Q4: Deepen localisation by using Regulation 9.3 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. This will go a long way towards facilitating the local procurement target of 75% set by government in the Medium Term Strategic Framework (MTSF).

2017/18 Q1-Q4: Provide training on local content to supply chain practitioners in all spheres of government and state owned companies.

Lead departments/agencies: the dti

Supporting departments/agencies: NT, DPE, EDD, SABS, PALAMA

3. Proudly South African campaigns to leverage local procurement

Nature and purpose of the intervention



Launched in 2001, *Proudly South African* is this country's Buy Local Campaign which seeks to promote South African companies, organisations, products and services that demonstrate high quality, local content and fair labour practices and which have sound and responsible environmental standards.

The focus areas and strategic thrust of the PSA Campaign, is "Buy Local" activism.

Proudly SA seeks to strongly influence procurement in the both the *public and private sectors*, to increase local production and stimulate job creation.

In addition to these economic implications, buying local can also have a broader social impact. Our efforts in the consumer/private sector speak to a legitimate sense of patriotism and social solidarity - we all know someone who is unable to find work, or who has recently lost their job.

Preserving and even creating jobs by making 'buy local' choices is a powerful message.

Targeted outcomes

Influence supply chain management choices by both large corporate institutions and SMMEs in favour of local products and services.

[NOTE: Whilst government creates the climate for job creation, it is companies that create actual jobs, and if businesses can support each other in the matter of procurement, existing jobs will be retained and further positions created, potentially offering new goods, services and revenue streams. It is therefore crucial that companies with large procurement budgets and supply chains support local manufacturers].

Key milestones

Note: these are annual targets that will continue over the next 3-year IPAP period.

2017/18 Q1 – Q4: Roll out a properly organised and sustained Buy Local (above and below-the-line) consumer education campaign targeting consumers and the private sector, including but not limited to advertising campaigns (*Buy Back SA*), business forums, sector specific forums, mall activations, youth targeted activities, Buy Local conferences and Expos.

2017/18 Q1 - Q4: Conduct public sector-specific roadshows aimed at educating both procuring SOEs and public sector officials (especially those involved in procurement) on the economy-wide benefits of buying local, whilst adhering strictly to PPPFA Regulations on designated sectors for local procurement.

This will be done in partnership with the State-Owned Enterprises Procurement Forum (SOEPF), National Treasury, Provincial Economic Development departments and the South African Local Government Association (SALGA) and other strategic partners.

2017/18 Q1 – Q2: Develop and re-launch the database of locally manufactured products and services, primarily hosted on the Proudly SA website, with an easy access, user-friendly search facility.

2017/18 Q3 – Q4: Sustained growth of database to include products across all sectors, with specific focus on products manufactured in labour-intensive and priority sectors.

Lead departments/agencies: the dti, PSA, EDD

Supporting departments/agencies: SOEs, SALGA, NT, DPE, Provincial Economic Development departments

1.1. National Industrial Participation Programme (NIPP)

Situational Analysis

The National Industrial Participation Programme is currently managing NIP obligations estimated at R10 bn, to be fulfilled over the next seven years. These arise out of purchases mainly from the following sectors:

- Defence (R1.5 bn);
- Oil and Gas (R1.7 bn);
- Automotive (R1.8 bn);
- Aerospace (R2 bn);
- Maritime (R306 m);
- Rail (R490 m),
- Energy (R1.8 bn);
- ICT (R502 m).

The number of companies with NIP obligations is spread over these sectors as follows: defence (7); Oil and Gas (12); Automotive (6); (4) Aerospace (7); Marine (3); Rail (3) and ICT (5).

The total number of domestic companies currently being supported through these obligations is 15; and these have attracted investments estimated at R395 m for both capital equipment and technology transfer, whilst creating 594 new direct jobs.

The National Industrial Participation (NIP) Programme seeks to support the development of the key industrial sectors of the economy, using companies with NIP obligations to:

- provide funding for support projects where funding is not ordinary available from traditional sources;
- provide support to local industries to attain required certification, standards and accreditation for local products to meet global standards;
- provide, where applicable, technological support - including equipment, software packages, improved manufacturing processes etc. that enable local companies to be globally competitive; and
- provide support for market access to increase exports of locally manufactured products.

In addition, there is a need for stronger alignment with other government procurement levers (e.g. The CSDP and designations). In the case of CSDP, the unit will work with OEMs to increase market access for local suppliers by providing support to export products to the OEMs' sub-assembly or assembly plants worldwide. The specific type of support will vary from company to company, but will incorporate one or more of the support measures discussed above.

For designated sectors or products, the support envisaged is to build on the preliminary work done in the past financial year, where the unit identified some suppliers who had been experiencing difficulties in meeting the designated local content percentages. The aim would be for this support to enable companies to create capabilities that would position them not just to meet but to exceed current and future required local content percentage levels.

In view of the strategic imperative to support industrial development and for domestic companies to be globally competitive, the unit has reached an agreement with one of the obligors and the Council for Scientific and Industrial Research (CSIR) to provide a full software suite for Product Life Cycle Management (PLM) to the CSIR - including free maintenance for a period of four years. This will enable the CSIR to support SMME development through the various product life-cycle stages including product development, manufacturing simulation, testing and prototyping. It is estimated that 2,000 companies over a seven-year period will be supported. The implementation of this programme will start in this financial year

The Programme operates across several different sectors of the economy and as such the identification and performance of projects is affected by the performance of the economy, both domestically and globally. The global economic slowdown has meant that in some industries (e.g. oil and gas) there have been some difficulties in identifying suitable projects - especially in view of the emphasis on direct NIP. The termination of Project Ikhwezi has resulted in the review, renegotiation and adjustment of NIP obligation agreements already signed. In most instances, the termination has led to many obligors reluctantly committing to NIP, citing lack of prospects for future business in South Africa as one of the reasons.

Constraints

The National Industrial Participation Programme derives its authority from Cabinet policy rather than an Act of Parliament. Although it places an obligation on suppliers of goods and services when they tender for (and are subsequently awarded) contracts, it is sometimes difficult to enforce once the contract has been awarded. In addition, NIP obligation agreements (giving approval to projects fulfilling NIP obligations) are only signed *after* the contract with the state-owned entity has itself been signed - placing companies with obligations in an advantageous position during the negotiation of these agreements.

Opportunities

The programme seeks to increase export of locally manufactured products by working together with Original Equipment Manufacturers on purchases aligned with Competitive Supplier Development Programme (CSDP) to enable the suppliers of some of these components to supply to other international programmes that the OEMs are involved in.

Specifically, this will target suppliers to the Transnet locomotive programme and the Prasa programme for rail signalling and passenger trains. This would enhance the sustainability and profitability of the domestic suppliers as they will not necessarily be confined to producing for local OEM supply but could expand to exporting the same product lines in international markets.



Key Action Programmes (NIPP-related)

1. Product Life Cycle Management Technology Centre

Nature and Purpose of Intervention

Small and medium-sized enterprises (SMEs) need a variety of support measures to develop into globally competitive companies. In addition, it is important that the time from concept development of the product to commercialisation and market is shortened and development costs reduced.

As discussed above, an agreement has been reached with an obligor and the CSIR for the obligor to provide the CSIR with a Product Life Cycle Management suite at no cost to the CSIR; and the package comes with free maintenance for a period of four years.

The software package will be installed at CSIR and the obligor will train CSIR, who in turn will train and support local companies to improve their processes from product development and prototyping to manufacturing and commercialisation. The SMEs will get free access to the PLM software when they need to develop their products. The value of this investment is estimated at R108 million. This is a multi-year rolling programme that will provide initial support to 12 companies already identified - and will expand to about 2,000 companies over a seven-year period.

Targeted Outcomes

Globally competitive SMEs; increased exports; job creation.

Key Milestones

- 2017/18 Q1: Installation of the software.
- 2017/18 Q2: Training of CSIR personnel, who will then be expected to train local companies (Train-the-Trainer Programme).
- 2017/18 Q3-Q4 Identify individual needs and design support measures for the already identified companies.

Lead Department/agencies: CSIR, the dti

Supporting Department/agencies: CSIR, DST, EDD

2. Support increased local content for designated products

Nature and Purpose of the Intervention

To better align government procurement levers, it is important that both NIPP and Designation must play supportive and complementary roles. Since the inception of designations, a number of companies supplying designated products have been struggling to meet the minimum local content requirements. NIP obligors can play a role in helping companies meet and even exceed minimum local content and quality levels. In addition, NIP obligors can support international market access by linking with their tier 1 or 2 suppliers. This would enable local suppliers to expand their customer base and not rely solely on government contracts for long term sustainability.

This is also a multi-year rolling programme. It will apply across a number of sectors and involve continuous identification of potential suppliers of designated products, whilst at the same time scanning for opportunities to increase local content and provide the necessary export support. Specific attention will be directed at those sectors that are deemed strategic.

The support to be provided by obligors could be in the form of accreditation and certification and/or technology transfer, depending on the specific needs of each local supplier.

Targeted Outcomes

Increased local content; increased exports.

Key Milestones

2017/18 Q1 – Q2: Identify constraints and opportunities for increased local content for designated products and their specific support needs to be able to manufacture at higher levels of local content.

2017/18 Q3 – Q4: Identify relevant obligors and negotiate and design support measures.

Lead Department/agencies: the dti

Supporting Department/agencies: EDD, DPE, SOEs

2. Industrial Financing

Situational analysis



The South African government's focus on Industrial financing has largely been informed by the notion of supply-side measures to restructure the production side of the economy to deal with increased global competition. Sector-specific support measures have now been in place for some years, notably in key sectors such as Automotives and Clothing, Textiles, Leather and Footwear (CTLF).

New incentives were also introduced to raise overall levels of manufacturing competitiveness and productivity; in particular, the Manufacturing Competitiveness Enhancement Programme (MCEP).

- The cost of capital is high and the average term of financing short, relative to South Africa's peer competitor middle income countries.
- The extent to which private credit extension has been channelled to the productive sectors, especially the manufacturing sector, has been limited.
- The scarcity of readily available working capital acts as an impediment on the operational performance of many firms, particularly in the start-up, new technology commercialisation and systems-building phases.
- The private sector venture capital market in South Africa is weak.

Previous iteration pointed to the need to develop a system of industrial financing, incentives and export support that is better able to support the manufacturing sector to raise competitiveness, output and exports.

Therefore, an approach is needed to achieve a better mix of public and private sector funding to support diversification in the manufacturing sector – especially in the light of the global recession. The shaping of such a package will have a very significant effect on the manufacturing sector's ability to absorb technology, adopt and commercialise new technologies and deliver innovation in equipment and systems.

In this regard, work which commenced in the 2016/7 financial year on a long term industrial financing and incentive architecture (in the context of constrained fiscal space) will be concluded early in the new financial year.

However, the focus for this iteration of IPAP will be on strengthening and more sharply targeting the support given to the manufacturing sector - with particular emphases on (i) supporting the competitiveness and sustainability of labour-absorbing sectors and sub-sectors – e.g. agro-processing and foundries; and (ii) supporting the export of South African goods to the rest of the continent.

Key Action Programmes

1. Finalising and implementing the Agro-processing incentive package

Nature and purpose of the intervention

Agro-processing is identified as one of the sectors that has potential to contribute in very significant ways to both economic growth and labour-intensive job creation. The sector plays a catalyst role in promoting economic participation through its ability to create backward linkages with primary sectors and forward linkages with downstream industries.

Targeted outcomes

Implementation of an incentive support programme that encourages a value-chain approach to value addition and the consequent strengthening of the agro-processing sector.

Key Milestones

2017/18 Q1: Approved guidelines for support of the agro-processing sector.

2017/18 Q2: Roll out of the incentive programme.

Lead Department/agencies: the dti

Supporting Department/agencies: EDD, NT

2. Finalising and implementing the Foundry Sub-Sector Support Package

Nature and purpose of the intervention

The Foundry sub-sector has also been identified as one with considerable potential to contribute towards job creation. It can play a key role as a first-stage building block in the metals beneficiation chain – and, as such, can be an important catalyst for growth in the wider manufacturing sector.

Targeted outcomes

The primary objective is to support investment in activities that improve the competitiveness of South African foundries and mini-mills (forging and rolling). The secondary objective is to encourage transformation through accelerating the increase and participation of Black Industrialists in the foundry and mini-mill sector.

Key Milestones

2017/18 Q1: Approved guidelines for support of the Foundry sub-sector.

2017/18 Q2: Roll out of the support programme.

Lead Department/agencies: the dti

Supporting Department/agencies: EDD, NT

3. Improving existing export support measures

Nature and purpose of the intervention

Optimally positioning the existing incentive programmes aimed at supporting export development on the African continent.

Targeted outcomes

The primary objective is to support activities that encourage exports to the continent and support industrialisation of the continent. The incentives should be positioned to address the needs of both exporters to the continent and the development of industrial projects on the continent utilising South African industrial inputs.

Key Milestones

2017/18 Q2: Draft proposal on support for export-orientated projects/activities on the continent, utilising existing incentive programmes.

2017/18 Q3: Final proposal on support for export orientated projects/activities on the continent, utilising existing incentive.

Lead Department/agencies: the dti, ECIC

Supporting Department/agencies: EDD, NT

4. Review of Export Credit and Foreign Investment Re-Insurance Amendment Act, 1957

Nature and purpose of the intervention

Despite ECIC and EMIA support, there is a significant need to improve access to finance available for exporters. This will require restructured and additional financial instruments (with clear evaluation criteria) that support increases in export volumes, product diversification and market diversification.

Financial instruments need to meet the requirements of all exporters: notably large, lead and dynamic enterprises and medium and small companies, both established and new.

The main financial support instruments required are:

- Providing affordable working capital for exporters considering the increased capital and cash-flow requirements associated with export, including delays in payments and shipping times.
- Additional financial products that will allow firms to increase their capacity and productivity (through e.g. double shifts) as well as the additional equipment that may be required to achieve scale when competing in the export market. Considerable improvement in access to existing export-orientated financial products such as Letters of Credit, Credit Guarantees and currency hedging.
- Provision of credit insurance for the export of general manufactured goods, which is currently not offered by the ECIC⁸.

Therefore, in support of the drive for greater participation of South African products and services in international markets, and the African Continent in particular, the Minister of Trade and Industry tasked ECIC to pursue new approaches and develop innovative offerings along the lines of an Exim-Bank, to more effectively support investors and exporters. This necessitates a review of the ECIC's enabling legislation which was initiated in 2016 and which will continue in 2017.



⁸ Credit insurance is important for exporters as it reduces their risk as well as that of financial institutions which provide financial support

Targeted outcomes

Through appropriate insurance and funding products, the ECIC could directly assist South African companies to offer more competitive value offerings. Practically this will not only create an environment that assists our companies to secure strategic projects and land additional value-added orders, but also facilitate integration into global value chains and unlock economies of scale in the light of our proximity to regional markets.

In addition, enhanced ECIC offerings could position South African manufacturing and exporting enterprises to more effectively pursue joint projects and leverage strategic partnerships (including within BRICS members) to inject a new dynamism into both economic growth and job creation.

Key milestone

2017/8 Q1- Q4: Report on the review of ECIC's legislation.

Lead department/agencies: the dti, ECIC

Supporting department/agencies: NT, EDD, Export Councils

3. Technical Infrastructure

Situational analysis



The global slowdown in growth and the recent devastating Southern African drought have together thrown up many challenges for the South African economy. During tough economic times, consumers tend to focus on perceived value-for-money in the marketplace and place trust in many of the cheaper products and services on offer, often without a second thought.

This places many responsibilities on government departments in all three spheres of government, regulatory bodies and other entities to ensure that such trust is warranted and maintained. Whether it is regarding food, consumer goods or transport safety, the quality infrastructure, also known as the South African technical infrastructure, provides a framework for assuring that goods and services are safe, and that the environment we live in is as well-protected as possible.

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).

South African organisations, big and small, that produce quality goods and services, use the technical infrastructure to reduce the risk of product failure and to comply with relevant legal requirements, such as health, safety or environmental regulations.

International trade requires exporting countries to be updated on the latest requirements and conform to new regulations. To take advantage of export opportunities, a solid technical infrastructure system is needed which is on par with the best globally and can rapidly respond to new international developments, ensuring ease of market access.

The role of a well-functioning Technical Infrastructure system is critical in the international trade arena. This is evident from the prominence that is placed by the World Trade Organisation on acknowledging that such a system, by basing its norms and standards on those developed by the corresponding international bodies, responsible for standards development, metrology, legal metrology and accreditation, could facilitate the reduction of unnecessary technical barriers to trade amongst trading partners.

A “Technical Barriers to Trade” Chapter forms an integral part of any trade agreement. The Technical Infrastructure Business Unit supported by the entities, actively participated in the recently concluded Tripartite Free Trade Agreement.

The negotiations for the Continental Free Trade Agreement have commenced and the Technical Infrastructure will also support the trade negotiators with the text for the Technical Barriers to Trade Chapter.

New sector developments emphasise the need for a stronger, up-scaled technical infrastructure framework that matches up to international best practice to ensure that we stay on par with our global trading partners.

The entities will continue to be forward-looking and responsive to the needs of current and future priority sectors within the South African economy.

Key opportunities

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

- Ensuring the linkages between Technical infrastructure entities are strengthened to support primary and secondary productive sectors of the economy;
- Proactively addressing key constraints faced by the priority sectors;

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

- Ensuring the linkages between Technical infrastructure entities are strengthened to support primary and 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 become more competitive in both regional 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 a 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.

Key challenges

- The 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 the programmes of the Technical Infrastructure Institutions. 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 can generate income.

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 seeks to align technical infrastructure activities with the Presidential 9-Point Plan and IPAP imperatives. IPAP focuses on the importance of a stable, sustainable and adaptable technical infrastructure able to respond to the needs of global markets, emerging businesses and new technological developments through the development of accurate measurement and testing capabilities, standards, compulsory specifications and accreditation programmes that serve identified priority areas within each sector.

NMISA is strengthening its dimensional measuring capabilities. The Length Laboratory has acquired new equipment (portable 3-D measurement articulated arm and Machine Tool evaluation laser system) to provide measurement and testing support to the automotive sector and the locomotive-building sector. The main methodologies in use are three-dimensional component compliance testing and on-site large artefact measurement of jigs and fixtures. In addition, machine tools can be calibrated to higher degrees of accuracy, thereby improving the competitiveness of South African manufacturing industry.

Targeted outcomes

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

1.1. Automotive Products and Components

Key milestones

2017/18 Q1-Q4: Upgraded national dimensional and torque measurement calibration and traceability methods.

2019/20 Q1-Q4: Upgraded national measurement laboratories for force in support of the general transport, manufacturing and automotive sectors.

Lead Department/agencies: the dti, NMISA

Supporting Department/agencies: EDD

1.2. Metal Fabrication, Capital and Transport Equipment

Targeted outcomes

Re-aligned and synchronised Technical Infrastructure Institution activities, better able to support IPAP and 9-Point Plan priorities.

Key milestones

2017/18 Q1-Q4: Establish reference measurements for metal alloy composition using X-ray photoelectron spectroscopy (XPS).

2017/18 Q1-Q3: Conduct a benchmark study to investigate how accreditation can support the rail industry.

2018/19 Q1-Q4: Develop and roll out an accreditation programme for the Railway Safety Regulator.

2019/20 Q1-Q4: Establish a Material Characterisation facility at NMISA, with internationally benchmarked and recognised capabilities, that can support metal beneficiation and fabrication.

Lead Department/agencies: the dti, NMISA, SANAS

Supporting Department/agencies: EDD

1.3 Revitalisation of Agriculture and Agro-Processing Value Chain

In response to an industry need to have matrix reference materials that are relevant to South African analytical measurement requirements, NMISA is establishing a reference analysis and reference material production facility in support of the agro-processing and export sector.

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 quality assurance on products to meet export requirements. In this regard, SABS continues to develop standards and provide the required conformity assessment services to allow for the food industry to produce quality products for local consumption and export.

Key milestones

2017/18 Q1-Q4: Provide reference measurement capability for toxic substances including heavy metals, arsenic, persistent organic pollutants, per-fluorinated compounds, brominated and chlorinated contaminants as well as dioxins and dioxin-like toxic substances in environmental and food matrices.

2017/18 Q1-Q3: Provide calibrant solutions for relevant mycotoxins.

2017/18 Q1-Q4: Provide reference materials for relevant mycotoxins and inorganic elements in food matrices (maize, ground nuts, etc.) in support of food safety.

2017/18 Q1-Q4: Develop reference measurement capability for amino-acids in food in support of food labelling regulation.

2017/18 Q1-Q4: Amend VC 8019, the Compulsory Specification for canned meat products.

2019/20 Q1-Q4: Expand reference measurement capability for contaminants: persistent organic pollutants (POPS), furans, dioxins and dioxin-like toxic substances) to provide an analytical service for the feed and food industries.

2018/19 Q1-Q4: Provide reference materials for POPS in fruit and vegetable matrices in support of food safety.

2019/20 Q1-Q4: Provide reference materials for dioxins in feed and food in support of both food safety (imported grain) and trade (exports).

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

Lead Department/agencies: the dti, NMISA, NRCS, SABS

Supporting Department/agencies: EDD

1.4 Biofuels

Key milestones

2018/19 Q1-Q4: Provide measurement standards for accurate measurement of biofuel properties.

Lead Department/agencies: the dti, NMISA

Supporting Department/agencies: EDD

1.5 Plastics, Pharmaceuticals, Chemicals, Cosmetics

Standards on identification of degradable plastics and on polymer film for damp-proofing and waterproofing in buildings will be developed to support the plastics sector.

SABS is also responding to the 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 2007 Biofuel Strategy also advocates for movement towards cleaner and environmentally-friendly energy sources in a bid to limit global warming; the project on fuel ethanol compression ignition engines is one of the initiatives to support the new biofuels industry.

Key milestones

2017/18 Q1-Q4: Build capability to perform traceable diagnostic measurements from blood samples in support of clinical diagnostics.

2018/19 Q1-Q4: Build capability to assign purity to peptides in support of biopharma, and protein quantification to support clinical diagnostic measurements.

2017/18 Q1: Source and train SANAS Technical Assessors for the Medical Devices and In-vitro Diagnostic programme.

2017/18 Q1-Q2: Roll out an accreditation programme for Medical Devices and In-vitro Diagnostic.

2018/19 Q1-Q4: Issue a new standard on supply-chain specifications for white petroleum products.

2018/19 Q1-Q4: Issue a new standard on automotive fuels – requirements and specifications for fuel ethanol compression ignition engines.

Lead departments/ agencies: NMISA, SABS, SANAS

Supporting Departments/agencies: the dti, EDD

1.6 Clothing, textiles, leather and footwear

In the clothing, textiles, leather and footwear sector, SABS plans to investigate the feasibility of standards for vegetable tanning methods which benefit the local leather sector and will allow access to international markets.

Standards in Personal Protective Clothing (PPC) are critical for ensuring safety in hazardous industrial environments such key sectors as the mining, electrical and petroleum industries.

Key milestones

2017/18 Q1-Q4: Assess feasibility of standards for vegetable tanning methods for leather.

2018/19 Q1-Q4: Develop new standards for personal protective clothing for hazardous industrial environments.

2017/18 Q1-Q4: Develop a Compulsory Specification for laundry process management.

Lead departments/ agencies: SABS, NRCS

Supporting Departments/agencies: the dti, EDD

1.7 Electro-technical and ICT

Standards are being developed to support the Department of Energy's strategy on smart grids. (i.e. a class of technology that people are using to bring utility electricity delivery systems into the 21st century, using computer-based remote control and automation).

SABS is also developing standards to support the electrical and electronics manufacturing sector by providing safety requirements for products.

Key milestones

- 2017/18 Q1-Q4: Conduct a feasibility study to establish the market requirement for national measurement standards for high voltage direct-current.
- 2018/19 Q1-Q4: Establish a national measurement standard for high voltage direct-current in line with industry requirements.
- 2017/18 Q1-Q4: Revision of safety standards on household and similar electrical appliances.
- 2017/18 Q1-Q4: New standards on communication networks and systems for power utility automation.

Lead departments/ agencies: NMISA, SABS

Supporting Departments/agencies: the dti, EDD

1.8 Nuclear energy

The support of national standards is essential for both the maintenance of the existing nuclear infrastructure and any new nuclear construction that may take place in South Africa. In response to the proposed nuclear build programme, SABS has established a technical committee (TC 85) to develop national standards for the application of nuclear energy, nuclear technologies and in the field of the protection of individuals and the environment against all sources of ionising radiations. NMISA is developing national measurement standards in support of environmental radiation monitoring, dosimetry (worker safety) and in general nuclear energy production.

Key milestones

- 2018/19 Q1-Q4: Validate and obtain accreditation for the radio-analytical measurement capabilities used for measuring environmental samples to ensure safety from ionising radiation.
- 2018/19 Q1-Q4: Establish capability to irradiate personnel monitoring dosimeters used in monitoring ionising radiation workers, in areas with neutron fields.
- 2019/20 Q1- Q4: Internationally benchmarked and accepted measurement capability for isotope ratio measurement
- 2019/20 Q1-Q4: Identify technical experts and train as SANAS technical assessors.
- 2019/20 Q1-Q4: Develop and roll out an accreditation programme for Nuclear Energy.

Lead departments/ agencies: NMISA, SANAS

Supporting Departments/agencies: the dti, EDD

1.9 Advancing Beneficiation



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 advanced 3D electron microscope). This will

allow for the accurate surface and bulk measurements of the composition, morphology and structural properties of metals and nanomaterials. The standard will also contribute towards the development of the fuel cell industry. Key industry stakeholders and government are making significant progress under the fuel cell technology programme to accelerate manufacturing locally.

Key milestones

2017/18 Q1-Q4: Focused Ion Beam Scanning Electron Microscope (FIB/SEM) with nano-manipulator for analysis and fabrication of nano devices.

2017/18 Q1-Q4: Internationally benchmarked capability to perform X-ray Diffraction (XRD) analysis of metal alloys.

2017/18 Q1-Q4: Revision of standards for fuel cells.

Lead departments/ agencies: NMISA, SABS

Supporting Departments/agencies: the dti, EDD

1.10 Growing the Oceans Economy

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. Support will also be provided to the oceans economy and aquaculture initiatives by ensuring that minimum food safety requirements are enforced on aquatic exports.

Standards developed to support the aquaculture sector will contribute towards the successful implementation of the Aquaculture Development and Enhancement Programme (ADEP) which aims to boost the oceans 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.

The NRCS is set to specify health guarantee requirements for exported consignments to facilitate access into foreign markets. It will also require a health guarantee for all imported products to be issued by the competent authority in the country of origin to protect South African consumers.

The aim of the project is to improve South African food safety controls on imported fishery products and canned meat products, and to secure a very significant reduction of non-compliant products entering SA.

Key milestones

2019/20 Q1-Q4: Certified reference materials for fish toxins.

2018/19 Q1-Q4: Benchmarked capability for ultrasound calibration (mapping of ocean floors, sonar, etc.).

2017/18 Q1-Q2: Develop a Compulsory Specification for live and chilled Raw Bivalve (oysters, mussels etc.) Molluscan Shellfish.

2018/19 Q1-Q4: Conduct a feasibility study for developing a Compulsory Specification for fish oil.

2018/19 Q1-Q4: New standard for dried abalone.

2018/19 Q1-Q4: Conduct a feasibility study for developing a Compulsory Specification for dried Abalone.

2017/18 Q1-Q4: Conduct a feasibility study for developing a Compulsory Specification for live and chilled fish.

2017/18 Q1-Q2: Proposed regulations for Import conditions for Fish & Fishery products and canned meats.

Lead departments/ agencies: NMISA, NRCS, SABS

Supporting Departments/agencies: the dti, EDD

1.11 Resolving the Energy Challenge/ supporting Green Industries

Alternative energy sources are vital to reduce 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 new NMISA facilities which will provide wind speed (anemometer) calibration services in support of wind farms. The envisaged outcomes will be to improve electrical efficiency, extend the lifespan and ensure the safety of lights.

Key milestones

- 2017/18 Q1-Q4: Improve the measurement accuracy for electrical power and energy by developing primary national measurement standards
- 2017/18 Q1-Q4: In support of air pollution monitoring, provide reference measurements to determine sizes of fine to coarse dust particles.
- 2018/19 Q1-Q4: Accurate measurements for gas composition through flow measurements using traceable PRGMs for natural gas and calorific value.
- 2017/18 Q1-Q3: Conduct a feasibility study for developing a Compulsory Specification for LED lights

Lead departments/agencies: NMISA, NRCS

Supporting Departments/agencies: the dti, EDD

1.12 Updating of the National Building Regulations and Building Standards Act

The National Building Regulations and Building Standards Act, Act No. 103 of 1977 is legislation that 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) prescription of building standards and associated safety matters. These require updating.

Key milestones

- 2017/18 Q1-Q4: National Building Regulations and Building Standards Bill drafted and submitted for Parliamentary legislative process.
- 2018/19 Q1-Q2: Amendment of relevant National Building Regulations to include plumbing requirements as per the Water Act.
- 2018/19 Q1-Q4: Conduct a Feasibility study on the need for an accreditation programme on Construction Management Systems.

Lead departments/ agencies: the dti, NRCS, SANAS

Supporting Department/agencies: EDD

1.13 Strategic review of legislation

The current legislation that governs the four Technical Infrastructure entities was promulgated between 2006 and 2008. To maintain a relevant and responsive South African technical infrastructure, a legislative review will be conducted to assess whether the current legislation is still effective and where appropriate provide recommendations for amendments to the existing legislation.

Key milestones

- 2017/18 Q1-Q4: Legislative review of the technical infrastructure – an investigation into the effectiveness of the four Acts and recommendations for amendments.

Lead departments/ agencies: the dti.

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

1.14 Consumer protection initiatives

The development of additional domestic cooking and toy safety standards.

Key milestones

- 2018/19 Q1-Q4: Conduct a feasibility study for ethanol gel for domestic cooking and other gel burning appliances.
- 2017/18 Q1-Q4: New standard for safety of toys - olfactory board games, cosmetic kits and gustative game.
- 2017/18 Q1-Q4: New standard for safety of toys - trampolines for domestic use.

Lead departments/ agencies: NRCS, SABS

Supporting Departments/agencies: the dti, EDD

1.15 Accreditation programme rollout

Key milestones

- 2017/18 Q1-Q4: Conduct a feasibility study on an Accreditation Programme for an Asset Management System.

Lead departments/ agencies: SANAS

Supporting Departments/agencies: the dti, EDD

1.16 Unlocking the Potential of SMMEs and Co-operatives

SMME development interventions to support their access to the formal commercial economy.



NMISA is developing Virtual Reality-based training modules for SMMEs and regional Metrology Institutes. The training modules will be made available on portable computers and smart-phones to train SMMEs in the basics of measurement and calibration.

Key milestones

- 2017/18 Q1: Virtual Reality training module for Uncertainty of Measurement and calibration of mass standards: level F and M of the International Organization of Legal Metrology (OIML).
- 2017/18 Q1: SANAS to equip SMMEs through accreditation training on SANS/ISO/IEC 17020 and management system documentation.
- 2017/18 Q1-Q4: SMMEs to be assessed for technical competency in measurement and verification.
- 2018/19 Q1-Q4: Virtual Reality training modules for high accuracy mass calibration (Level E of OIML); calibration of thermometers; calibration of dimensional standards.

Lead departments/ agencies: NMISA, SANAS

Supporting Departments/agencies: the dti, EDD

1.17 Collaborative research support programme on Science and Technology

All levels of research, be they basic, applied or developmental, need measurement to gauge progress. Measurement infrastructure is then the cornerstone of taking innovation to implementable solutions. 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 nanoscience and its applications. A wide range of other measurement capabilities are available for joint research projects with academia and science councils. Collaborative projects have been established with six local universities and are being expanded to universities abroad.

Cross-cutting research projects have been initiated with the National Metrology Institutes of Germany, China, India, Brazil, the USA and Italy. Pan-African research projects are being established with Egypt, Kenya, Ethiopia and Ghana.

Key milestones

- 2017/18 Q1 - Q4: Tri-lateral project plan with Egypt and Kenya to develop a primary mass standard (Watt balance and Avogadro sphere project) in anticipation of the re-definition of the International System of Units in 2018.
- 2018/19 Q1 - Q4: Research project on bioanalysis and mechanical engineering in support of infrastructure development.
- 2017/18 Q1 - Q4: Project on small field dosimetry in anticipation of the small field dosimetry protocol to be published by the International Atomic Energy Agency in 2018/19.
- 2018/19 Q1 - Q4: Quantum hall resistance standard and project plan for primary standards for ampere (current and voltage) and kelvin (temperature).
- 2018/19 Q1-Q4: Prototype Watt balance as new primary mass standard.
- 2019/20 Q1-Q4: Primary standard for amount of Substance (Avogadro project).

Lead departments/agencies: the dti, NMISA, DST

Supporting Department/agencies: EDD

1.18 Water and Sanitation standards support programme

The minimisation of water loss is critical towards preserving the scarce water resources which have been threatened by prevailing (and foreseeable) drought conditions. Standards on services valves for domestic water fittings, and on alternative water saving solutions such as greywater reuse systems will benefit the sector.

Key milestones

2017/18 Q1-Q4: New standard for greywater reuse systems - general requirements.

2017/18 Q1-Q4: New standard for servicing valves for domestic terminal water fittings or appliances.

Lead departments/agencies: the dti, SABS

Supporting Department/agency: EDD

1.19 Transport Infrastructure support programme

Key milestones

2017/18 Q1-Q4: Upgrade of the national measurement laboratories for Force in support of transport, manufacturing and the automotive sector.

2017/18 Q1 - Q4: Feasibility study to identify standardisation needs of the National Infrastructure Plan.

Lead departments/agencies: the dti, NMISA, SABS

Supporting Department/agency: EDD

1.20 Broadband Rollout Support Programme

NMISA has updated its wavelength measurement capability and its dispersion measurement capabilities (specifically polarisation mode dispersion and chromatic dispersion) in the Fibre Optics field in support of the ICT industry.

SA Connect - the national broadband policy and associated strategy and plan - gives expression to the country's vision in the National Development Plan (NDP) of "a seamless information infrastructure by 2030 that will underpin a dynamic and connected information society and a knowledge economy that is more inclusive, equitable and prosperous".

Part of the Broadband policy rollout will be implementing action plans focusing on standards and compulsory specifications. SABS has already published national standards that support broadband technology.

Key milestones

2017/18 Q1-Q4: Revision of standards for optical fibres – measurement methods and test procedures.

Lead departments/agencies: the dti, NMISA

Supporting Department/agency: EDD

1.21 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.



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.

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 standards and conformity assessment are therefore of great 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 in structures such as African Regional Standardisation Organisation (ARSO) where, amongst other things, the key focus is on harmonisation of standards as one of the key levers for growing intra-African trade.

Similarly, NMISA, NRCS, SANAS and **the dti** are playing a leading role in the advancement of the technical infrastructure within SADC and the wider African Continent. This is reflected in the hosting of the Secretariats of AFRIMETS (NMISA/NRCS), SADC MET (NMISA), SADC MEL (NRCS), SADCA (SANAS), AFRAC (SANAS), SADCTRLC (**the dti**).

The South African Technical Infrastructure Institutions will also embark on a campaign to celebrate the “Africa Year of Quality”.

Targeted Outcome

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

Key milestones

- 2017/18 Q1-Q4: Develop comparison programme within AFRIMETS to compare National Measurement Standards of all countries participating in the CIPM Mutual Recognition Arrangement.
- 2017/18 Q1-Q4: Virtual Reality training module for calibration of accurate mass standards (E level) and length standards.
- 2017/18 Q1-Q4: SABS to actively inform the strategic agenda of ARSO through participation in the ARSO structures.
- 2018/19 Q1-Q4: Identify relevant ARSO standards for harmonisation by SABS.
- 2017/18 Q1-4: Egyptian Accreditation Council (EGAC), SANAS and Tunisian Accreditation Council mutual recognition arrangement re-evaluation preparing for recognition by ILAC and IAF of the AFRAC Mutual recognition arrangement in 2018/19.
- 2018/19 Q1-Q2: SADC Accreditation Service (SADCAS) scope extension evaluation preparing for recognition by ILAC and IAF of the AFRAC Mutual recognition arrangement in 2018/19.
- 2018/19 Q1-Q4: AFRAC applies for mutual recognition by ILAC and IAF of the AFRAC mutual recognition arrangement in 2018/19.

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

Supporting Department/agency: EDD

4. Competition Policy

Situational analysis

For industrial policy to be effective, it needs to operate within a well-functioning product market environment for enhanced rivalry and easy entry for new firms.



A competitive product market environment should allow:

- new firms, particularly small and medium enterprises, to challenge incumbents;
- efficient firms to grow and stay ahead of their rivals; and
- firms in general to invest and innovate at a scale that can help boost both the pace and the pattern of economic growth.

But there are two main policy ingredients which are necessary for an inclusive growth-enhancing competition environment. First, product market regulation should be set in a way that does not hamper competition. Second, an effective competition enforcement framework needs to be in place that safeguards a level playing field among firms.

The point of departure for competition enforcement is the recognition that the South African economy continues to experience ongoing problems regarding high levels of concentration in a number of markets that are dominated by a few entrenched firms. Importantly, where anti-competitive conduct concerns important inputs to downstream, labour-absorbing activities, it directly impacts on employment. Also, anti-competitive behaviour adversely affects low-income households through inflated pricing of consumer goods that they rely upon.

Key areas that remain extremely problematic are:

- The concentrated supply of certain strategic inputs into manufacturing and other productive processes;
- Concentration in the purchasing of inputs; with the effect that value-adding and labour-absorbing manufacturers often face both upward costs and downward price pressures;
- The persistence of barriers to entry in input markets.

In some cases, competition is also adversely affected by regulation that limits entry and price competition in key input sectors. This has implications both for input prices across the economy and for the entry of new firms.

Competitive product market outcomes require more than an effective competition enforcement regime; they require an appropriate and responsive regulatory framework. Interventions across institutions must be geared to ensuring competitive product markets which are essential to the achievement of the objectives of IPAP. This means the removal of anti-competitive regulatory frameworks, removal of barriers to entry and support for the entry and growth of new firms in these markets.

The Competition Commission's 2017/18 work programme will pay particular attention to critical sectors of the economy which have a major bearing on inclusive economic growth. The priority sectors of the Commission include food and agro-processing, energy, intermediate industrial inputs and construction and infrastructure. The Commission will also increase its engagement with Government and public institutions to play a more active role in following up on findings regarding systemic anti-competitive conduct and making aggressive remedial recommendations to government.

Key Action Programmes

1. Effective competition enforcement and merger regulation

Nature and purpose of the intervention

This programme seeks to effectively use the mandated instruments as per the Competition Act on targeted manufacturing and services sectors, with the aim of improving compliance and reducing anti-competitive behaviour in the economy. This includes the regulation of mergers and acquisitions, the investigation and prosecution of abuse-of-dominance and restrictive conduct, and the dismantling of cartels.

The South African economy continues to be dominated by a few entrenched firms which exploit market power through anti-competitive behaviour, including taking advantage of consumers and creating barriers to entry.

Targeted outcome

Improved economic welfare for consumers and reduced barriers to entry for small and medium manufacturers.

Key milestones

2017/18 - 2018/19:

Continued effective competition enforcement with regard to the following sectors:

- **Food & Agro Processing:** the entire value chain (production, processing, distribution and retail).
- **Intermediate Industrial Input Products:** inputs into strategic manufacturing products such as steel, chemicals and fertilisers.
- **Construction & Infrastructure:** includes construction products and services and transport and logistics (movement of goods and products).
- **Healthcare:** entire value chain, including services and the pharmaceutical market.
- **Energy:** includes markets related to electricity, renewables, LPG (industrial and domestic usage), nuclear and fuel.
- **Banking & Financial Services:** entire sector, including industries such as insurance and retail and corporate banking activities.
- **Information & Communication Technology:** telecoms services and products, including markets related to interconnection.

2017/18 - 2018/19: Annual reporting on the impact and outcomes of competition enforcement in these sectors, and identification of appropriate complementary measures to be taken by government and public institutions to improve competitive outcomes.

2017/18 - 2018/19: A number of strategically identified market enquiries initiated by the Competition Commission into priority areas identified in consultation with government.

2017/18 - 2018/19: Stronger conditionalities to be established on state support for large firms, including development finance, linked to competitive conduct.

2017/18 - 2018/19: Monitoring of compliance, in consultation with government.

Lead departments/agencies: EDD and Competition Commission

Supporting departments/agencies: the dti, IDC

5. Export promotion and support



Implementation of the Integrated National Export Strategy (INES)

The INES covers a basket of interventions at the macro and micro levels of export development and promotion. The revised INES focuses on four pillars:

1. The enabling environment and global competitiveness;
2. Increasing the demand for South African goods and services through market diversification;
3. Broadening the exporter base through the National Exporter Development Programme (NEDP); and
4. Strengthening strategic export promotion mechanisms through enhancing South Africa's value-proposition and broadening the export base.

The INES is anchored in the mandate of promoting exports of value-added goods and services in the IPAP priority sectors, with which it is fully aligned.

The role of Trade & Investment South Africa (TISA)

TISA will focus on developing concerted export development and promotion support packages for companies housed within the Special Economic Zones and Industrial Parks.

To this end, in the period under review, the implementation of the INES focused on product, market and supplier diversification, with the exporter base including both national export champions and OEMs. These exporters are supported by financial measures under the EMIA and by the ECIC to contribute to export-oriented employment.

South Africa's unique value proposition – from the point of view of both national champions and OEMs - lies in its proximity to African and Middle Eastern markets; and it has a well-developed set of bilateral trade agreements in place.

TISA is also developing a *services export strategy* which is aimed at assisting South African firms to integrate into regional and global supply chains of multinational firms, by actively promoting subcontracting in power, infrastructure programmes and the built environment.

As part of the INES, TISA continues to develop a pool of export-ready companies under the National Exporter Development Programme (NEDP), which includes the Global Exporter Passport Programme (GEPP). The GEPP is aimed at developing South Africa's export culture through export awareness and outreach programmes, as well as mobilising established enterprises to become exporters.

Attention will now be focused on companies located within Special Economic Zones and Industrial Parks based on a revised GEPP incorporating an Export-Readiness Assessment. International experience has proven that clustering of export development activities around SEZs and Industrial Parks can create important inter-company synergies for enhanced export performance. In rolling out the GEPP, TISA will partner with the SEZs and Parks in providing training to companies located in each of the facilities.

Notwithstanding existing support from ECIC and EMIA, there is a significant need to improve access to other avenues of finance potentially available to exporters. Exporters require restructured and additional financial instruments (with clear evaluation criteria) that support increases in export volumes, product diversification and market diversification.

Financial instruments need to meet the requirements of all exporters: notably large and dynamic enterprises as well as medium and small companies, established and new. They also need to address the need for affordable working capital for exporters: specific products such as Letters of Credit, credit guarantees, currency hedging and the provision of credit insurance for the export of general manufactured goods, which is not currently offered by the ECIC. The ECIC is, however, developing innovative offerings along the lines of an Exim Bank, which will more effectively support investors and exporters.

Through appropriate insurance and funding products, the ECIC could directly assist South African companies to offer more competitive solutions. Practically this will not only create an environment that assists our companies to secure strategic projects and land additional value-added orders, but also facilitate integration into global value chains and unlock economies of scale considering our proximity to regional markets.

Furthermore, enhanced ECIC offerings could position South African enterprises to more effectively pursue joint projects and leverage strategic partnerships (including within BRICS) towards delivering significant contributions to economic growth and job creation.

6. African Industrial Development



Situational analysis

The industrialisation of the continent is taking centre stage across regional forums as the central mechanism to drive structural transformation of the regional economy and achieve sustainable long term

growth that is not resource-dependent. This rests on the pillars of regional integration to achieve the necessary economies of scale and resolve the infrastructural constraints that have retarded regional trade and investment.

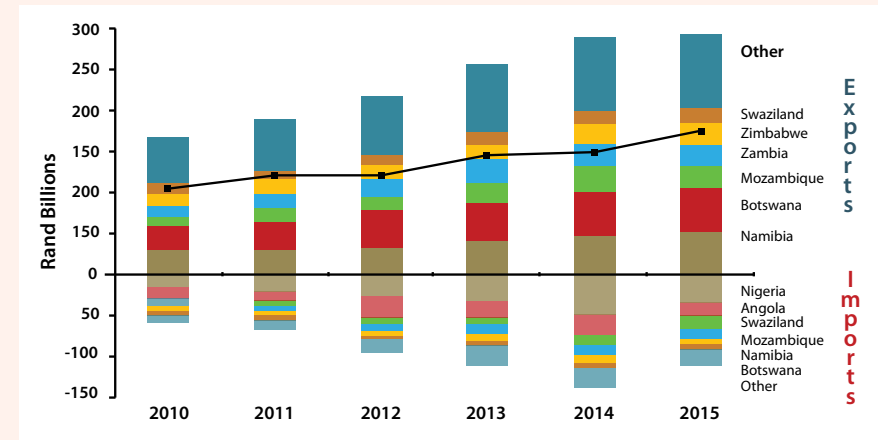
To this end, South Africa, as the most industrialised economy on the continent, has a key role to play both in terms of contributing to the body of public sector knowledge around industrialisation (and the institutions and systems that support it) and in working with our national industrial champions to support substantive productive investments in key regional value-chains.

the dti has played an active role in the SADC Industrialisation process as a key initiative in supporting better policy tools for use by SADC states. The emphasis will now increasingly shift to implementation. Understanding of regional value-chains (and the need for their integration) has been highlighted as a critical instrument in identifying concrete opportunities that can be further developed to tackle the structural constraints holding back regional development. **the dti** aims to support the work of the SADC secretariat by deepening the work around regional value chains, engaging with industrial champions and landing projects and investments in collaboration with the private sector and member states.

Exports to the rest of the continent have risen dramatically, to the point where Africa now represents the largest single market for South African producers, at 31% of its total exports at the end of FY 2016, comprising over 50% of manufactured goods. The challenge for government is now to shift from an export play to encouraging deeper connections with SA's trading partners, in the form of strategic investments and joint ventures. This is reflected in the data, with a steady increase from R10 bn in 2010 to over R35 bn in 2014. South Africa has an opportunity to invest, transfer skills and bring in technology and management practices that will enhance the industrialisation of the region and provide a more sustainable model of development.

Currently, outward investment is dominated by the financial and insurance corporates at 38%, with manufacturing and agricultural investment combined at only 27% of the total. The latter is where the South African government and private sector should be substantially more active.

Figure 1. SA Trade balance with RoA: 2010 - 2015

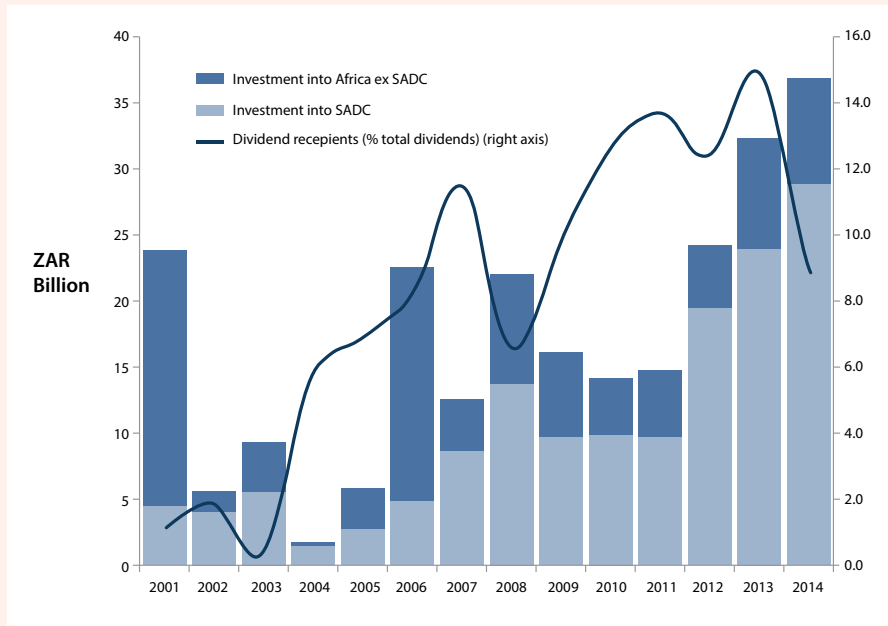


Source: Quantec data

As reflected in figure 1 above, the six leading African export markets - Botswana, Namibia, Mozambique, Zimbabwe, Zambia and Swaziland - accounted for 69% (R200 bn) of merchandise exports to the rest of the continent. The top three export partners in Africa are Botswana, Namibia and Mozambique, accounting for the highest export shares of 18%, 17% and 10% respectively. South Africa's imports from other African economies totalled R113 bn in 2015, 80% of which having originated from the six African countries illustrated in Figure 1. Excluding imports from oil producing nations, South Africa enjoys a nearly 10:1 trade surplus with the rest of continent.

This imbalance has contributed to the build-up of considerable resentment from a number of its trading partners, resulting in several cases of non-compliant defensive tariff measures. Most member states have also implemented local content legislation of 20% up to 50%, depending on the products – and in certain instances have banned imports in an attempt to encourage local production. Under the principle of developmental integration, the drive will be to shift from an export-led to an investment-led strategy.

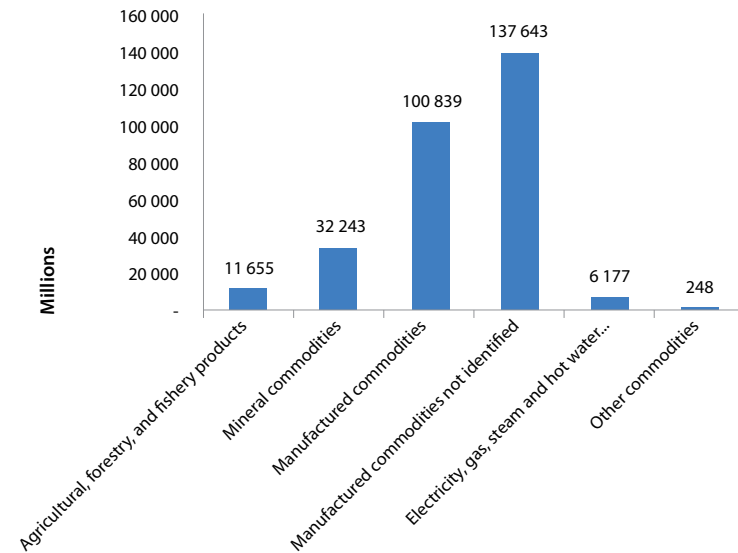
Figure 2. Investment by SA into the continent



Source: National Treasury/ Reserve Bank data

The dti is now strengthening the capacity to work with and encourage local industry players to increase their profile on the continent - and where appropriate to establish long term productive investments in-country. As per Figure 2 above, it is clear that this has increased substantially over time, although it continues to be dominated by investment in financial services and insurance - as per Figure 3 below.

Figure 4: Top Sectors traded with the rest of Africa 2015



Source: Quantec data

NOTE: "Manufactured commodities not identified" reflected on Figure 4 includes: transport equipment, mining (excluding coal & other non-metals) and mineral products subsectors. The export of transport equipment had the highest growth due to the demand for manufactured motor vehicles. "Manufactured commodities" comprises predominantly motor vehicles, food and beverages, basic iron & steel, petroleum products, motor vehicle parts, basic non-ferrous metals & basic chemicals.

The top 10 exported goods are precious stones and metals, oil and mineral fuels, motor vehicles & parts, ores, industrial machinery, iron & steel, fruit & nuts, electrical machinery, beverages and aluminium. Manufactured products represented 87.4% of South Africa's merchandise exports to other African countries in 2015.

In working with leading globally competitive companies as the arrow-heads behind which a host of infra-structural 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 focus for the strategy. Secondary opportunities exist in the oil and gas sector and in infra-structural services into port, rail, water reticulation and energy distribution.



The development of Africa's automotive sector in key hubs such as Kenya and Nigeria represents an important potential avenue for collaboration and association. A further area of opportunity to be explored is a focus on production hubs for materials and services 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 in order to open up the economies of scale required to allow regional pharmaceutical production to take off.

Trade Invest Africa

TRADE INVEST AFRICA was launched on 15 July 2016 to implement an outward investment-led trade strategy towards the rest of Africa. The dti recognises that South Africa's trade relations with rest of Africa have to be rooted in investments in African partner economies for mutually beneficial economic outcomes.

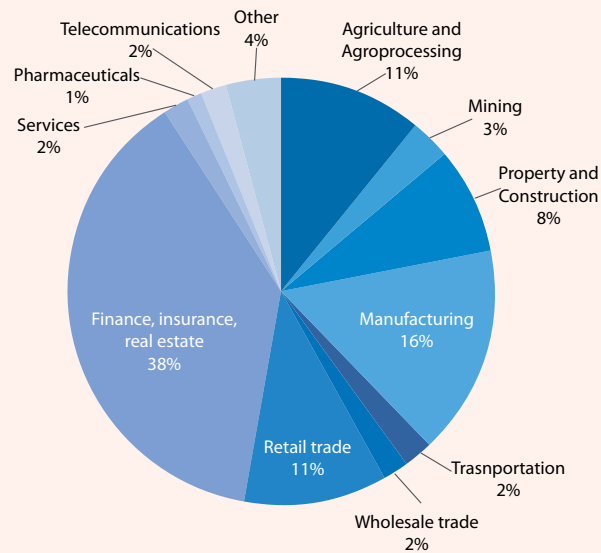
The African market is very important for South African producers, particularly for those producing value-added products. Almost 29% of South Africa's merchandise exports in 2015 were sold in other African countries. South African enterprises are also involved across the continent as investors and providers of services. While South Africa needs to continue to pursue all opportunities for mutually beneficial trade and investment with other countries on the continent, it also needs to prepare to move into other new places in regional value chains, particularly as other countries industrialise and seek to enter space currently occupied by South African products.

Trade Invest Africa will look at ways in which investment led trade can move South Africa into new supplier arrangements as South Africa cooperates with other countries to promote developmental integration.

Trade Invest Africa's current offerings to South African business include facilitating access to markets and investment opportunities, facilitating access to finance for projects, market research, as well as inter-governmental platforms for strategic economic engagements.

Trade Invest Africa also advocates for the recently launched voluntary Code of Good Business Practice for South African companies operating elsewhere on the continent, to ensure that South Africa remains a real, non-divisive partner in the development of the African continent.

Figure 3: Investment into Africa by Sector (2013)



Source: National Treasury, Reserve Bank data

The focus on investment-led strategies culminated in the launch last year of Trade-Invest Africa (TIA) to actively partner and facilitate South African business on the continent. The dti is also focusing increasingly on identifying a limited number of strategic, long term developmental “mega-opportunities”. This will see the alignment of government departments, the deepening of bilateral relationships with prioritised member states, strategic support for lead firms, the drawing together of South Africa’s financial offerings and the facilitation of the necessary infrastructure required to develop capacity across the region.

Key Action Programmes

1. Work programme of the Regional Economic Communities

Nature and purpose of the intervention

The main priority for South Africa in terms of its African agenda is supporting the development of industrial growth in the SADC region as the most critical element in ensuring sustainable long-term growth in the region. To this end, the African Industrial Development (AID) unit has put considerable resources into supporting the development of the SADC Industrialisation Action Plan that was finalised in February 2017 and will be formally adopted in the current year.

The focus for the year will therefore be on assisting in the implementation of the plan, in the mutual interest of the region and South African business. The approach will be both top-down, where the regional-wide constraints to growth will be addressed, as well as bottom-up - in terms of facilitating concrete industrial opportunities.

The AID unit will continue to support the industrialisation agenda of the Continental Free Trade Area (CFTA) as well as the Tripartite Free Trade Area (TFTA). Progress will, however, largely be dictated by the regional trade and integration work-streams. The unit will also provide input into the SACU industrialisation agenda where appropriate.

Targeted outcome

Increased co-operation between South Africa and the regional economic communities, and an increase in the number of technical and institutional projects embarked on.

Key milestones

- 2017/18 - Q1: Influence and support the formal adoption of the SADC Industrial Action Plan.
- 2017/18 - Q4: Support the implementation of the Action Plan, giving particular attention to prioritising development in the agro-processing, mineral beneficiation and pharmaceutical value-chains as an initial focus. Actively provide technical guidance to three value-chain projects that include identification of potential private sector partners, supporting infrastructure and/or institutional capacity building.

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

Supporting Department/agency: EDD

2. Build an African Industrial Development Knowledge Repository, manage value chain research and support capacity building across the continent

Nature and purpose of the intervention

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

It will also actively promote sharing of best practice and capacity-building across the continent, through the establishment of a research network facilitated by TIPS. As a new initiative, **the dti** will be supporting a “mini APORDE” (Africa Programme on Rethinking Development Economics) that will target key industrial policy officials across the region.

The call by the United Nations Economic Commission for Africa (UNECA) for developing “smart states” to facilitate industrialisation will be a key objective within relevant departments.

Data scarcity across the African continent is a significant challenge. To enable effective policy development, it is important to strengthen the 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 with National Treasury and UNU-WIDER around the regional programme has been initiated that should raise the profile and impact of regional research.

Targeted outcomes

The number of partnerships developed with leading researcher bodies across the continent; the number of research projects initiated; and success achieved in holding a Regional African Industrial Development Conference.

Key milestones

2017/18 – Q2: Strengthening of the regional research networks and the convening of quarterly research meetings to agree research priorities for the region.

2017/18 – 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 on 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 coordination between the financial community, the Development Finance Institutions and **the dti** is required in identifying potential projects, dealing with specific blockages early on, and then facilitating feasibility studies for the projects.

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

Targeted outcome metrics

Number of projects at either pre-feasibility or bankability stage; facilitation of industrial projects through to inception.

Key milestones

2017/18 – Q4: 10 industrial projects identified and scoped as possibilities for detailed project preparation or feasibility studies.

2017/18 – Q4: Facilitate investment by SA-based companies into 3 industrial projects across the continent.

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

4. Facilitation of Strategic Opportunities for South Africa on the continent

Nature and purpose of the intervention

To encourage better alignment and impact by South African companies and institutions, **the dti** is working with a full range of role-players to identify and prioritise several 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 to the full extent. This is exceptionally important in competing successfully on the continent.

The **dti** will develop and facilitate a more integrated approach towards 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 ensuring a more holistic view of the quantum of commercial, infra-structural and skills requirements for each basket of projects. Clearly these opportunities should be developed as a win-win partnership between South Africa and the relevant member states.

Targeted outcome

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

2017/18 Q3: Identification of 2 mega-projects for intensive research, relationship building and facilitation.

2017/18 Q4: Orientation of new strategy around the strategic opportunities, in order to deepen South Africa’s involvement in them.

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

Success Story on Regional Value-Chains research

As part of the initiative to support regional integration efforts, South Africa has initiated a series of ground-breaking regional value-chain studies dealing with cross-border opportunities in the agricultural, mining and infrastructure services.

A number of these studies have now been completed, covering poultry-soya, supermarket strategies, capital goods in the Copper-Belt, infrastructural services into rail and construction, forestry and the sugar-to-confectionary value-chains. A number of other studies are under way in household chemicals and products and capital goods and services into the energy sector.

Importantly, these research reports identify critical new investment opportunities for follow-up, and also identify potential constraints that act as a guideline for bottom-up interventions by governments across the region. A case in point is the potential to replace deep-sea soya imports from South America into South Africa's poultry feed sector by imports from Zambia. It appears that Zambia has the potential to grow soya competitively, but due to excessive logistical costs this has not been seen as an option.

A team is now working with the regional soya and poultry industry and logistics providers to focus on the price points required to enable processed soya to be landed at prices that are competitive with or better than deep-sea imports. A project emerging from the Copper-Belt research is the importance of the South African government working with exporters of capital goods to provide a far more complete package of support, particularly in terms of skills upgrading and supporting local manufacturers. To this end the concept of a South-African/ Zambian hub has been scoped and negotiations are under way between both governments to bring this to reality.

Part of the success of this programme has been developing a network of researchers and government officials across the region to work on these studies. The researchers are brought together in quarterly meetings to share lessons from the research and to input into improving the methodologies. To boost this, it has been decided to also introduce a "mini-APORDE" (African Programme on Rethinking Development Economics) specifically to empower key government officials across SADC as a critical ingredient in applying successful industrial policy.

7. Special Economic Zones (SEZs)

Situational Analysis

Special Economic Zones are an important tool to support the country's long-term industrialisation and development of key industrial capabilities. The development of special economic zones is aimed at increasing the flow of domestic and foreign direct investments into host regions; developing, strengthening and deepening key value chains in host regions; and increasing both host regions' and national exports. In addition, the special economic zones should contribute to the development of additional industrial hubs and thus regional diversification of the country's industrial base.



Richards Bay

Over the past few years, work in this programme focused on the development 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 long-term economic viability of new proposed zones.

Going forward, more effort will go towards the development and promotion of viable special economic zones. Marketing of designated zones and development of targeted industrial clusters within and around these zones will therefore be prioritised.

Key opportunities

Some of the opportunities linked to the Special Economic Zones Programme include the following:

- Unique opportunities in each of the designated zones in the country;
- Mineral development linked industrial development opportunities;
- Oil and gas development linked industrial development opportunities; and
- Green industries.

Constraints

Underdeveloped infrastructure, especially outside the main industrial hubs, including the following:

- Insufficient energy supply;
- Poor road and rail linkages;
- Absent or extremely weak education and training infrastructure;
- Water shortages;
- Port inefficiencies: in particular, cargo terminal capacity constraints;
- Unattractiveness of some regions to domestic and foreign professionals; and
- Capacity constraints of agencies implementing the SEZ Programme.

Key Action Programmes

1. Designation of Special Economic Zones

Nature and purpose of the intervention

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 powers to designate a special economic zone are 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 outcome

High-impact, economically viable SEZ projects are identified, developed, approved 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

2017/18 Q1: Review of two applications for designation by Secretariat and Technical Sub-committee of the Board.

2017/18 Q2: Review of at least one application by the Board.

2017/18 Q3: Gazette notice of one application for designation published for public comments.

2017/18 Q4: Designation of one SEZ.

Lead departments/agencies: the dti

Supporting departments/agencies: NT

2. Institutional and capacity development

Nature and purpose of the intervention

Strengthening the capacity of agencies responsible for the implementation of the SEZ Programme to improve efficiency and effectiveness.

The success of the SEZ Programme depends on the capacity of implementing agencies to plan, design, develop, manage and operate the zones. Continuous institution- and capacity- building are necessary for the success of the SEZ Programme.

Targeted outcome

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

Key milestones

2017/18 Q1: Recruitment of candidates for candidates for SEZ Training in China.

2017/18 Q2: Training in China takes place.

2017/18 Q3: Report on the Training in China approved.

Lead departments/agencies: the dti

Supporting departments/agencies: NT

3. Marketing Plan for Special Economic Zones

Nature and purpose of the intervention

Implementation of a programme to promote South African Special Economic Zones locally and internationally.

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 a clear strategy and programme for engaging the targeted domestic and foreign investors.

Targeted outcome

International and domestic investors are aware of the South Africa's Special Economic Zones and the opportunities on offer.

Key milestones

Quarterly Milestones: One Investment mission per quarter.

Lead departments/agencies: the dti

Supporting departments/agencies: NT

8. Innovation & Technology

(Chapter provided by the Department of Science & Technology)

1. LEVERAGING SCIENCE, TECHNOLOGY AND INNOVATION FOR INDUSTRIAL GROWTH AND DEVELOPMENT

Situational analysis

Science, Technology and Innovation (STI) are recognised as key drivers of long-term economic growth, which today is increasingly led by the creation and distribution of knowledge for the enrichment of all fields of human endeavour. STI becomes a major source of competitive advantage, wealth creation and improvement in overall quality of life⁹, but only if properly coordinated, distributed and used by stakeholders across a national system of innovation (NSI) that has the capacity to absorb and quickly adapt to new forms of knowledge and technical capabilities.



In South Africa, the centrality of STI to national development has been firmly highlighted in the National Development Plan (NDP¹⁰). The NDP notes that the developments in STI are fundamentally altering the way people live, connect, communicate and transact, with profound effects on economic growth and development. STIs are key to equitable economic growth because technological and scientific revolutions underpin economic advances; improvements in health systems; education and infrastructure.

⁹ Ten Year Innovation Plan (TYIP) 2008-2018, Department of Science and Technology, South Africa.

¹⁰ The National Development Plan: Vision for 2030. National Planning Commission, 2011

To realise the national potential of a fully developed STI, STI investments are essential for the country's transformation to a knowledge-based economy, as indicated in the NDP, the White Paper on Science and Technology (1996), successive IPAPs and other national policy documents.

The growing focus on STI can, in part, be attributed to the following factors:

- Substantial increase in global science, engineering and technology (SET) efforts, leading to enhanced capability and knowledge potential;
- Increased participation of developing countries in global SET activities;
- The ever-increasing levels of complexity and technological capability embedded in components/products, leading to an associated reduction in the life span of the products;
- Significant growth in higher technology - and advanced manufacturing goods, indicative of changing global exports and markets; and,
- Technology has a time-bound value, implying that continuous knowledge reinvestment is required, regardless of the type of industrial sector.

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

Situational analysis

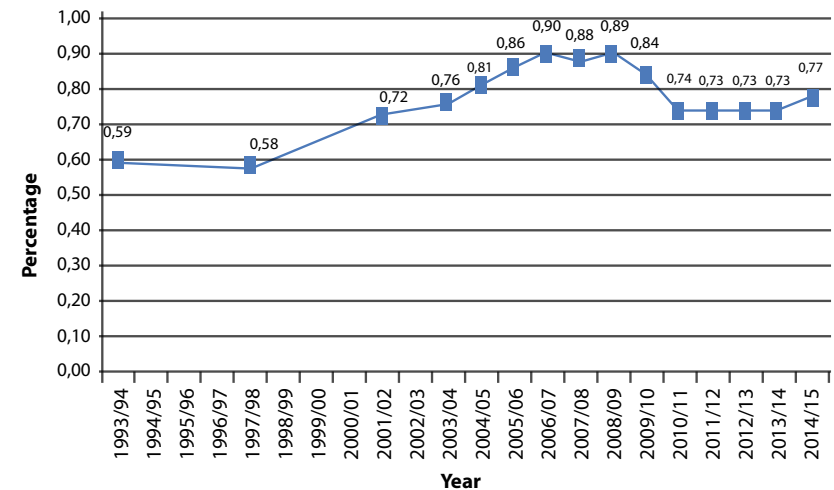
South Africa's STI policy package¹¹ provides a sound basis for further improvement and up-scaling of the country's industrial development interventions as stipulated in the National Industrial Policy Framework (NIPF) and as driven by the IPAP. The DST's focus in support of economic and industrial development will be structured as follows over the next five years:

2.1 Focus on knowledge creation

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

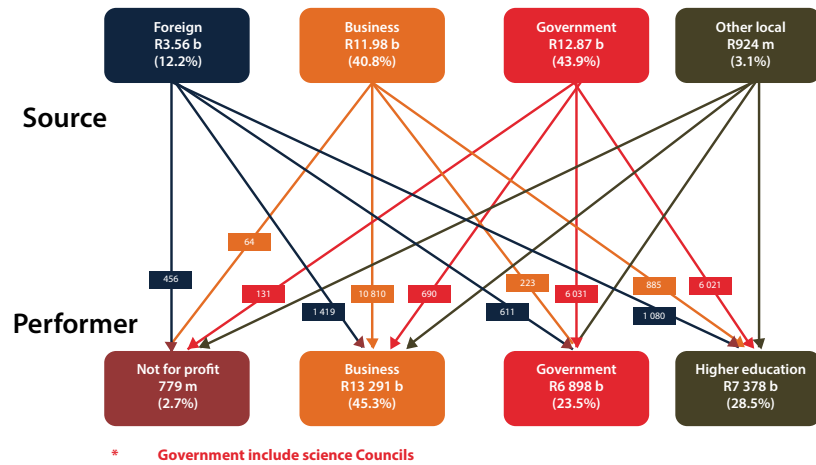
Expanding knowledge generation/production capacity is essential for increased efficiency gains across the economy. The target is to substantially increase the Gross Expenditure on R&D (GERD) as a percentage of the Gross Domestic Product (GDP). After being static at 0,73% of GDP, the latest measurement indicates a small increase to 0,77%, which is encouraging. (See Figure 1 below).

Figure 1: GERD as a % of GDP



¹¹ As articulated in the White Paper on Science and Technology (1996); the National Research and Development Strategy (2002), as well as the Ten-Year Innovation Plan (2008 to 2018).

Figure 2: R&D Funding Flow Diagram



The strategic outcome-oriented goal for increased knowledge generation is to maintain and increase the relative contribution of South African researchers to global scientific output over the next five years. The proxy indicators in this regard are:

- Proxy indicator 1: 22,032 researchers supported by 2019.
- Proxy indicator 2: Publication of at least 33,700 research articles supported by 2019.
- Proxy indicator 3: Number of articles co-published with researchers on the African continent doubled.

The abovementioned indicators are achieved through various instruments and DST initiatives. Some of the main interventions described are:

2.1.1 South African Research Chairs Initiative (SARChI)

The purpose of SARChI is to substantially increase the human capital pipeline, particularly at postgraduate level. The main goal of the Research Chairs Initiative is to strengthen and improve the research and innovation capacity of public universities to produce high quality postgraduate students as well as research and innovation outputs. There are currently 199 SARChIs funded at 20 universities.

2.1.2 The Centre of Excellence (CoE) initiative

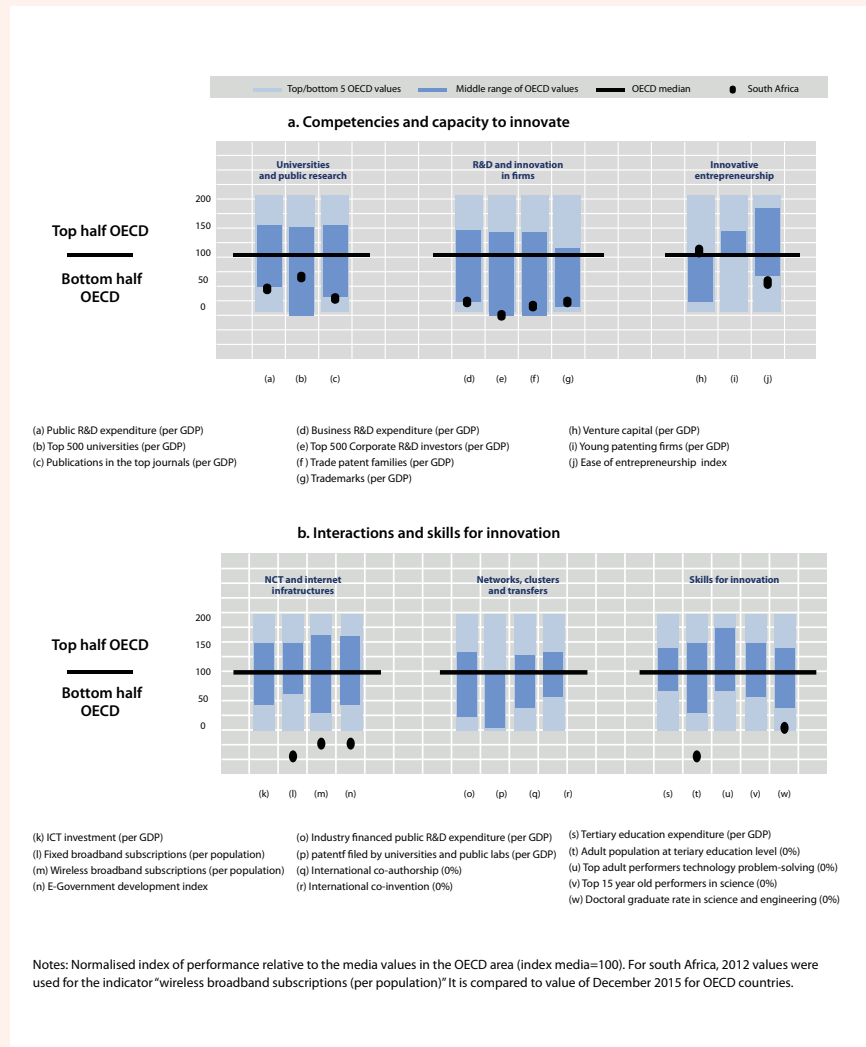
The CoE initiative is aimed at building human capital in specifically defined areas of scientific research endeavour. There are currently 15 CoEs at 7 universities.

2.1.3 The postgraduate bursary programme

The bursary programme is essential to help build the human capital pipeline; create the next generation of researchers and upgrade the quality and profile of the associated research outputs.

Despite its relatively small size, South Africa's knowledge production compares favourably with that of the OECD and the G20 countries, as depicted in Figure 3.

Figure 3. SA researcher efficiency¹²



2.1.4 Postgraduate internship programme

To ensure that more graduates find employment and bridge the gap between formal training and the skills required in the workplace, the DST has instituted a dedicated internship programme. There are currently two components to this programme, namely:



- The Graduate Internship Programme, which is implemented by the National Research Foundation (NRF) and is open to students who have already obtained a degree, but who have not yet secured employment.
- The Engineering Training Programme, implemented by the Council for Scientific and Industrial Research (CSIR), which is open to predominantly University of Technology (P2 and P3) students who require practical or workplace experience to complete their P qualifications.

3.1 Increased emphasis on supply-side innovation policy measures

3.1.1 Increased impact of R&D investment through budget coordination

Since 1 April 2015, the DST has investigated options and finalised proposals on a budget coordination process which will be piloted during the 2017 Medium-Term Expenditure Framework (MTEF) process. This process is intended to maximise the use of R&D funding across various government departments.

3.1.2 Implementation of the DST Commercialisation Framework

Following the finalisation of the DST Commercialisation Framework (CF) in 2015, a series of CF Implementation Protocols (CFIPs) have been developed in consultation with key NSI stakeholders. The purpose of these (draft) CFIPs is to enable:

- The systematic assessment of DST-funded technologies and programmes to gather evidence to support DST Executive Committee decisions to fund, further fund and/or exit the Department's R&D investments pertaining to commercialisation opportunities.
- The building of a commercialisation pipeline for DST-supported R&D programmes.

¹² G20 Innovation Report, OECD, November 2016

- The development of effective commercialisation partnerships with industry and other public sector innovation support initiatives, both nationally and internationally.
- The draft CFIPs will be refined for adoption during the 2017/18 financial year (FY).

3.1.3 Partnerships with private industry and sector representatives

During 2016, the DST entered into several strategic partnerships with industry and private sector representative organisations. Collectively, these partnerships better enabled the coordination of activities between government and the private sector by providing opportunities to jointly identify and develop innovation policy interventions, which will enhance entrepreneurial ecosystems for technology-based companies across South Africa. These partnerships will be expanded and strengthened throughout the 2017/18 FY.

3.1.4 Increased support to SMEs for innovation outputs

The Technology Stations (TS) Programme consists of a network of 18 stations, including 3 Institutes of Advanced Tooling (IATs) which are hosted by various Higher Education Institutions (HEIs), in particular the Universities of Technology (UoTs). The TS Programme is used as an instrument to provide technology support, infrastructure and services to local enterprises with a primary focus on small and medium enterprises (SMEs). The aim is to improve their level of competitiveness. The TSP is expected to provide technological support to more than 2,000 SMEs per annum to improve innovation outputs, competitiveness and SME effectiveness.

3.1.5 Ongoing harmonisation of innovation support initiatives

The DST commissioned research in 2016 aimed at supporting government in gaining better understanding whether the current allocation and deployment of public resources to incentivise private sector investment in RDI is done in a manner that maximises the return on investments.

The research agenda is a response to ongoing concerns among policy makers that sub-optimal investment in R&D may be further negatively impacted by unnecessary duplication and/or overlap among existing public educational instruments, therefore resulting in a failure to attract and leverage significant levels of private sector investment in full or co-funding for RDI.

The research is therefore intended to assess the existence and extent of such overlaps to facilitate consensus building on the most efficient mechanisms to deploy and manage public funding across government in collaborative synergy with the private sector. The research will be finalised and the findings shared during late 2017.

3.1.6 Maturing technology for commercialisation

The mandate of the Technology Innovation Agency (TIA) is derived from the provisions of the Technology Innovation Act (Act 26 of 2008), which established TIA as an Agency to promote the development and exploitation of discoveries, inventions, innovations and improvements, in the public's interest. The objective of TIA is thus to support the State in stimulating, developing and intensifying technological innovations to improve economic growth and the quality of life of all South Africans.

3.1.7 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 sectors¹³".

In November 2016, the Directors General's (DGs) of the DST, **the dti**, and the Economic Development Department (EDD), agreed to jointly motivate for the establishment of the Sovereign Innovation Fund as a public-private funding partnership that is aimed at harvesting and commercialising South African technology innovations for deployment in national and international markets. To this end the DST has drafted and further revised a Concept Note which details the rationale for the Fund. The Fund will be established in 2017 as a new national financing instrument, which will ideally involve formal equity finance funded by both the public and private sectors.

¹³ 2016 State of the Nation Address (SONA). <http://www.gov.za/speeches/president-jacob-zuma-state-nation-address-2016-11-feb-2016-0000> Accessed on 27 June 2016

3 Demand-side innovation policies

Such policies are increasingly important as they are based on leveraging market demand as an activator (i.e. leveraging the demand for innovation). There are various measures to increase the demand for innovation, such as are:

- Public procurement;
- Pre-commercial procurement;
- Innovation inducement prices;
- Standardisation and standards;
- Regulation.

A classification for demand-side innovation measures, developed by the OECD¹⁴, is provided in the table below as a reference for future work, but also to help integrate the efforts across government and its respective entities.

Table 1: Demand side measures classification

<p>Public demand</p> <ul style="list-style-type: none"> • General procurement (innovation as an essential criterion in the tendering and assessment process) • Strategic procurement (the demand for certain technologies, products and/or services is encouraged) • Cooperative and catalytic procurement (public agencies purchase in connection with private demand) 	<p>Private demand</p> <ul style="list-style-type: none"> • Direct/financial support (demand subsidies and tax incentives) • Indirect/soft steering support (awareness building; labelling and information campaigns; training and other further education; articulation and foresight; user-producer interactions)
<p>Regulations</p> <ul style="list-style-type: none"> • Regulation of demand (to create a market; process and 'usage' norms) • Regulation of demander-produced interface (regulating product performance and manufacturing; regulating product information; supporting innovation-friendly private regulation activities) 	<p>Systemic approaches</p> <ul style="list-style-type: none"> • Integration of demand-side measures (strategically coordinate measures which combine various demand side instruments) • Integration of demand- and supply-side logic and measures (combination of supply-side instruments and demand side impulses or selected technologies or services; conditional supporting of user-producer interaction; pre-commercial procurement)

In support of the national focus on leveraging public procurement, the DST is implementing the following demand-side innovation instruments:

3.1 Leveraging Public procurement

One of the most effective demand-side innovation instruments is 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.

The TLPs interventions is offered based on several instruments:

1. 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.
2. Sector-Wide Technology Assistance Package (SWTAP): This provides technology assistance for a range of firms in a sector.
3. Technology Development Grants: These provide funding to mature local technologies that might be used in local procurement.
4. Experiential Training Programme: This enables predominantly P1 and P2 students to complete their practical training, thereby enabling them to complete their qualifications.

¹⁴ European Commission: DG Research and Innovation: 'Supply and Demand Side Innovation Policies', 2015.

5. 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 3,200 South African manufacturing firms in the database, which is maintained and continuously expanded with the aim of facilitating new supply chain relationships.

3.2 Strategy for the update of locally developed technologies

The strategy for the uptake of locally developed technologies is a new action which is described under the first Key Action Programme.

3.3 R&D tax incentives

The South African R&D tax incentive (in terms of section 11D of the Income Tax Act, 1962) is aimed at encouraging the private sector to undertake more intensive R&D in South Africa. The DST implements the incentive programme, working in conjunction with the South African Revenue Service (SARS) and National Treasury. The incentive consists of a 150% tax deduction on expenditure incurred on R&D activities approved by the Minister of Science and Technology. The 150% tax deduction has been in place since November 2006, and can be accessed by companies of all sizes in all sectors of the economy.

At a corporate tax rate of 28%, the incentive translates into 14 cents per Rand spent on R&D. With reduced R&D user costs, it is expected that firms will scale up their R&D activities significantly in the short term.

The 2015/16 R&D Tax Incentive Annual Report estimates that the incentive supported R36.1 bn in R&D expenditure. About 61.9% of this was in priority focus areas of the current IPAP.

About 81% of the supported R&D is in manufacturing and financial intermediation, real estate and business services, as shown in Table 4 below.

Table 4. Sectoral R&D expenditure

Sectors	R&D expenditure supported (R' millions)	% of R&D expenditure per industry
Agriculture & related	1 469.1	4.1%
Mining and Quarrying	1 982.3	5.5%
Manufacturing	24 469.0	67.8%
Electricity, Gas & Water Supply	1 048.5	2.9%
Transport, Storage & Communications	1 617.0	4.5%
Finance & Business Services	5 180.7	14.4%
*Others	300.3	0.8%
Totals	36 066.9	100.0%

* Others include Construction, Wholesale & Retail Trade and Community & Social Services.

4 Specific STI-intensive initiatives



South African researchers, engineers and innovators continue to develop new technologies with the potential to disrupt the current status quo – i.e. innovations that help create substantially new technologies, markets and value networks, in a manner that will eventually disrupt and displace existing technologies, markets and value networks over a period of time¹⁵.

The DST is currently funding a number of potentially high-impact¹⁶ cross-cutting programmes requiring close integration and support from other departments. Such programmes have the potential to renew existing industries or establish new ones; making a substantial contribution to longer term, sustainable competitiveness, and the penetration of new markets.

Examples of R&D-led industry development programmes are:

- Titanium metal powder manufacturing development;
- Fuel cell development;
- The Fluorochemicals Expansion Initiative; and
- Additive manufacturing (3-D printing).
- Biotechnology (including agricultural, health, industry and IKS applications).

¹⁵ The term is deemed to have been originally coined by Prof Clayton Christensen, Professor of Business Administration at the Harvard Business School (HBS). See also: <http://www.christenseninstitute.org/key-concepts/>

¹⁶ From the perspective of economic growth, competitiveness and local value addition.

Such programmes are knowledge-intensive and based on proprietary know-how, with corresponding markets often not yet established. This implies that, in view of the technical and market risks, development funding is not easy to secure. Besides the financial aspects, speed of technical and market development is deemed key to success. To help create an enabling environment for these type of programmes, the DST has created various supporting platforms and initiatives (capacities, services, infrastructure and programmes), actively incorporated the reporting of these programmes at inter-departmental level and established joint steering committees that involve the IDC and industry from an early stage. DST also provides a focus on applications that contribute to national imperatives – such as the Operation Phakisa and the AgriParks Initiative.

The fast-moving scientific fields – particularly in the health and agricultural areas - may also require attention to policy and regulatory evolution and development, such that the opportunity to establish new or disruptive technologies can be seized

In addition to helping to prepare for the industries of tomorrow, the DST, in close collaboration with **the dti**, has also started to consider at a policy and technological level (i) the potential scenarios that the 4th Industrial Revolution could catalyse in South Africa, and (ii) the proactive responses that need to be developed to position South Africa optimally for this new global phenomenon.

Key Action Programmes

1. Strategy for the adoption of locally developed technologies

Nature and purpose of the intervention

The economic impact of research and technology development is realised when the respective technologies are absorbed in the market. During August 2016, the Lekgotla identified the need to enhance the deployment of locally developed technologies, resulting in a request to the DST, supported by **the dti**, to develop a strategy for the deployment 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 potential areas; namely defence and security technologies, social infrastructure technologies and health technologies.

Phase 1 (2016/17 to 2019/20) will focus on identifying opportunities for deploying 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 in these areas to finalise procurement modalities of potential technologies by the end of the first quarter of 2017.

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 the measures that will be required to accelerate commercialisation of locally developed technologies and engaging with the private sector on specific areas of opportunity - 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.

Targeted outcomes

Increased commercialisation of locally developed technologies to accelerate the creation of successful products, processes and services.

Key milestones

2017/18 Q2: The formalisation of the strategy for the uptake of locally developed technologies.

2017/18 Q4: The established of a partnership with the private sector for the deployment of locally developed technologies in one of the abovementioned focus areas.

Lead departments / agencies: DST, the dti

Supporting departments / agencies: EDD, DoD, DoH

2. Commercialisation Framework implementation

Nature and purpose of the intervention

The implementation of the DST Commercialisation Framework (CF), which was approved in 2015/16, will be guided by the refinement of a series of CF Implementation Protocols (CFIPs). The Protocols were drafted in 2016 in consultation with a range of key public sector NSI stakeholders, including the Industrial Development Corporation (IDC), the National Intellectual Property Management Office (NIPMO) and the Technology Innovation Agency (TIA).

The draft CFIPs will be refined for approval and adoption in 2017/18. This will entail the selection of suitable DST candidate projects and programmes as test cases for the assessment of commercial potential and for referral and/or follow-on funding to other relevant stakeholders across the NSI. Based on the learning obtained from these processes, the CFIP will be revised as needed.

Once approved by the DST Executive, it is expected that the CFIPs will be adapted to further enable coordination across other relevant government departments and entities. This process is envisaged to be supported and facilitated through the formal establishment of the Commercialisation Collaboration Forum (CCF) during 2017/18.

The CCF, which has been meeting on an informal basis since 2015, comprises of representatives from a range of publicly-funded technology development and commercialisation funding and support organisations that contribute directly, or indirectly, to national technology commercialisation value chains.

Going forward, regular engagements at the CCF are intended to enable the sharing of information and best practice, underpinned by enhanced contact across the various government departments and entities that are involved in technology development and commercialisation. Once formally established, it is envisaged that the CCF will facilitate the development of a National Innovation Charter and serve as a structured platform for the coordination of technology commercialisation initiatives across government and with the private sector.

The Commercialisation Framework (CF) is aimed at supporting the DST, and ultimately government as a whole, in enabling the translation of a greater proportion of publicly funded R&D outputs into socio-economically useful products, processes and services. It is envisaged that the implementation of the CF across government will be facilitated by the CCF once formally established.

Targeted outcome

Improved coordination of technology development and commercialisation initiatives across the public sector to fast-track the commercialisation of new technologies.

Key milestones

- 2017/18 Q3: First round DST candidate projects assessed as part of the finalisation of the CFIPs.
- 2017/18 Q4: CFIPs refined and presented to DST Executive for approval.
- 2017/18 Q4: Establishment of the CCF formalised through requesting nominations of representation from relevant government and private sector organisations.

Lead departments / agencies: DST

Supporting departments / agencies: the dti, NT, EDD, DSBD, TIA, IDC, science councils, universities, and relevant private sector organisations.

3. Harmonisation of innovation support programmes

Nature and purpose of the intervention

South Africa has strong science and technology capabilities and generally well-developed STI institutional frameworks.

However, the purpose of this DST-commissioned research is to assess the existence and extent of overlaps and redundancies between existing innovation support frameworks and programmes. This will require consensus-building on the most efficient uses of public funding across government in synergy and collaboration with the private sector. The research will be finalised and the findings consolidated with those of other related departmental research initiatives of the DPME and **the dti**, among others, in late 2017.

This intervention is aimed at facilitating harmonisation and synergies between existing and future innovation support programmes across departments and entities for increased impact on the growth of the economy.

Targeted outcome

Stronger coordination and coherence in the use of R&D in the promotion of innovation as a key driver of growth.

Key milestones

2017/18 Q3: Preliminary research findings presented to the DST Executive.

2017/18 Q4: Findings compared and consolidated with other relevant research findings.

Leading department/agency: DST and **the dti**

Supporting departments/agencies: DPME, the dti, DSBD, EDD, NT, IDC, TIA, NRF, NIPMO

4. Establishment of the Sovereign Innovation Fund

Nature and purpose of the intervention

The Fund is to be established in 2017 as a new national financing instrument, which will ideally involve formal equity finance in the form of public and private sector investments. The Fund is intended to launch from the platform of an initial contribution from government in the order of R1 billion to R1.5 billion in 2019/20. The national pool of funding will then be increased through co-investments from the private sector.

The Concept Note and Business Case towards the establishment of the Sovereign Innovation Fund will be finalised by the DST during 2017/18, together with **the dti**, the EDD and other vested departments.

Targeted outcomes

Recognising the role of science, technology and innovation (STI) in support of the National Development Plan (NDP), it is envisaged that the Sovereign Innovation Fund will serve as a structured national investment platform for a period of ten years, with the following aims and objectives:

1. Developing a strategic portfolio of investment opportunities to foster high-tech and technology-enabled entrepreneurial initiatives.
2. Creating funding certainty for high-technology developments, particularly those that will serve to modernise the South African economy and embrace the opportunities of the Fourth Industrial Revolution.
3. Establishing policy coherence through the coordination and integration of funding activities across government.
4. **Encourage private sector investment** for economic development, including the promotion of investment by both local and foreign-based companies, into productive investments, including greenfield investments, as well as into activities that will employ large numbers of South Africans which will be vital for development.
5. Strengthening national efforts to implement sustainable economic growth, considering not only the country's current challenges but also anticipating the needs of future generations (including climate change mitigation and food and water security).

Key milestones

- 2017/18 Q2: Revised Concept note developed and presented to National Treasury for comment and input.
- 2017/18 Q3-Q4: Government and private sector consultations continued.
- 2017/18: Finalisation of a business case for the establishment of the Innovation Fund.

Leading department/agency: DST, EDD and the dti

Supporting departments/agencies: DPME, DSBD, NT, IDC, TIA, and private sector

CASE STUDY:

TLIU supports traction transformer localisation project

In March 2014 Transnet awarded the largest ever locomotive contract in South Africa to four foreign OEMs - one of which was **Bombardier Transport (BT)** - for the manufacture of 240 locomotives out of the total of 1,064.

Bombardier Transport locomotives will be equipped with **ABB Traction Transformers**. Only 45 units of the Traction Transformers will be manufactured in Geneva and imported into South Africa, while the remaining units are being manufactured and assembled within ABB's local facilities, supported by sub-component provision by several local manufacturing companies.

The Technology Localisation Implementation Unit (TLIU) - which implements the DST's Technology Localisation Programme - engaged with ABB to support this localisation project. The TLIU has a well-established database of local manufacturing companies and, together with ABB, was soon able to identify the most promising sub-component manufacturers. The three major sub-assemblies identified for local manufacture were traction transformer tanks, magnetic circuits for the main active part, magnetic circuits for the three-phase transformers and the aluminium conductor. However, to manufacture the components required for the identified sub-assemblies, a total of 7 companies had to be identified at 1st and 2nd tier supplier levels to ABB. Most the suppliers identified were small businesses.

The suppliers that were selected have been linked directly to ABB Geneva to receive manufacturing and product knowledge for the manufacture of the products. Personnel from each company have been part of a skills transfer programme with ABB and training has been conducted both in South Africa and at other ABB locations. Specific

technology has been transferred to the suppliers to ensure that they meet the necessary global quality standards. The first article inspection for each component produced by the suppliers will be conducted by a joint team of ABB and Bombardier. ABB has also assisted the suppliers by placing ABB subject matter experts at certain companies for the continuous teaching and mentoring process accompanying the knowledge transfer process.

Facts and figures:

- The DST, via the Technology Localisation Programme, provided funding to the value of R9 million for this project.
- ABB has co-invested to the value of R6 million.
- The total revenue that will be generated through the project is valued at R350 million, with a local content value of R350 million.
- The project is expected to result in 55 jobs being created at ABB and 150 jobs at the 7 local supplier locations.
- The cumulative increase in revenue for the 7 suppliers is expected to be valued at R94.5 million.
- However, the greatest impact for the suppliers is that (based on their performance) they will have the potential to be included in ABB's global supply chain.



CASE STUDY:

Aeroswift - High speed additive manufacturing for large metal parts
Additive manufacturing (also known as 3D printing) has now started to prove that it is one of the technologies that is materially changing the face of manufacturing.

The *Department of Science and Technology (DST)*, as part of the initiatives under the portfolio 'R&D led industry development' has been funding the development of a broad research and technology development base or additive manufacturing in South Africa, spread across most of the universities, and a number private sector partners (large and small), focusing on areas such as certification for additive manufacturing, medical applications, powder development, and general awareness. Besides, the broad technology development funding, the DST is also funding the Aeroswift project, based on its potential to unlock substantial new industrial development activities.

Aeroswift is a high speed, large volume, additive manufacturing system for metal part production; and has been exclusively developed in South Africa, by the *Laser Centre* and the *South African Department of Science and Technology*.

The Aeroswift machine is a powder-bed fusion system and has a build volume of 2m x 0.6m x 0.6m. The machine was developed to allow for the production of very large complex parts, as well as the production of large batches of smaller parts for the aerospace and other industries. By having the capability to produce large batch quantities, machine overheads are minimised and overall cost of the additive manufacturing process is reduced.

The machine utilises a 5kW laser to enable very fast build rates. The high-power laser affords build rates 5-10 times faster than that of similar technologies, which reduces the manufacturing costs of parts and broadens the application space of additive manufacturing.

In 2016, the first titanium aerospace parts were produced on the Aeroswift machine. These parts are scheduled to fly in 2017. The next phase of development will be aimed at industrialisation of Aeroswift technology for commercial use.

South Africa has the second largest titanium reserves in the world; and a national drive is taking off to develop a titanium industry that incorporates the beneficiation of titanium from ore to final product. This project, along with a number of other projects in the country (of which the most relevant is the development of Ti powder directly from ore) is focused on developing the overall titanium value chain in South Africa.

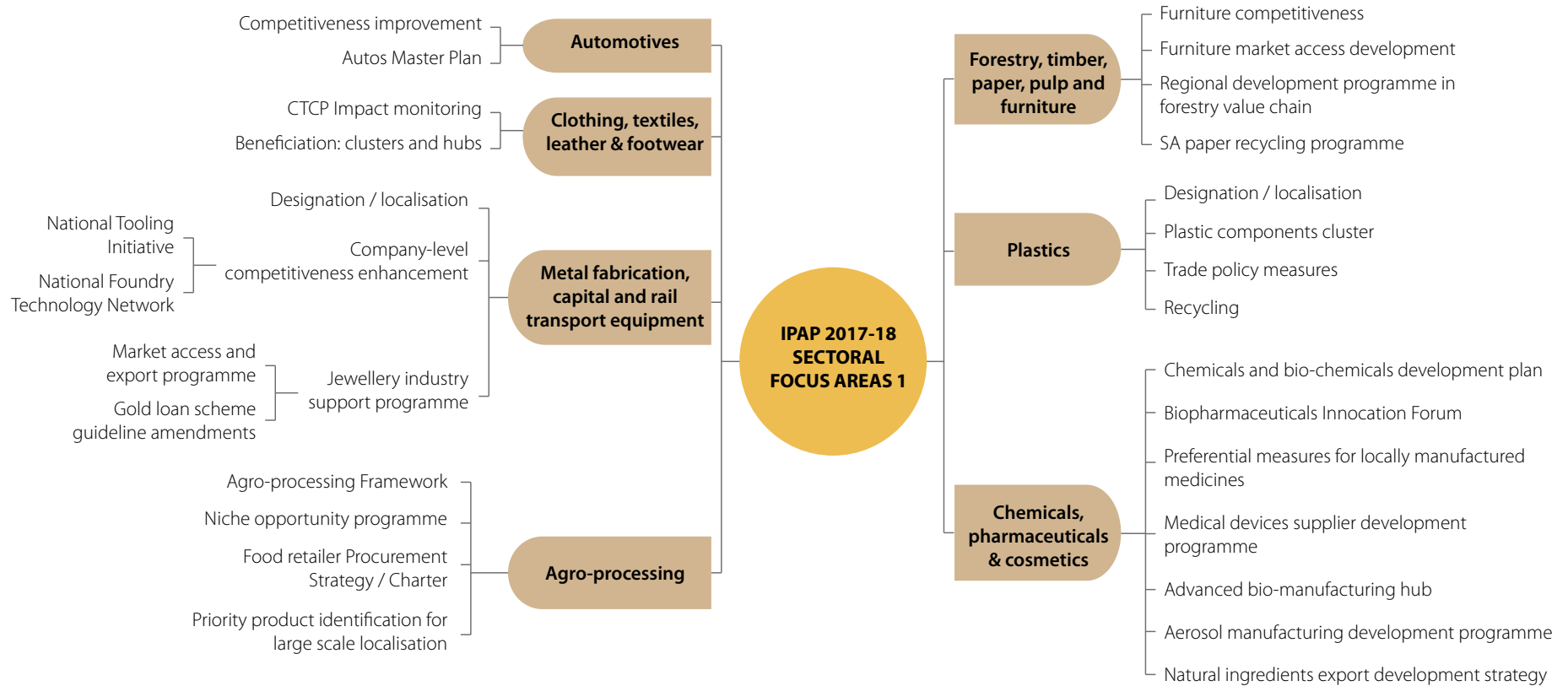
Titanium parts produced on the Aeroswift technology



The Aeroswift machine with a build volume of 2m X 0.6m X 0.6m



IPAP 2017/18 – 2019/20: SECTORAL FOCUS AREAS 1



1. Automotives

Situational Analysis

The automotive sector remains an important driver of South Africa's economy, contributing about 7.5% of GDP in 2015. (Automotive manufacturing activities account for 33.5% of South Africa's total manufacturing output and 14.6% of South African exports).

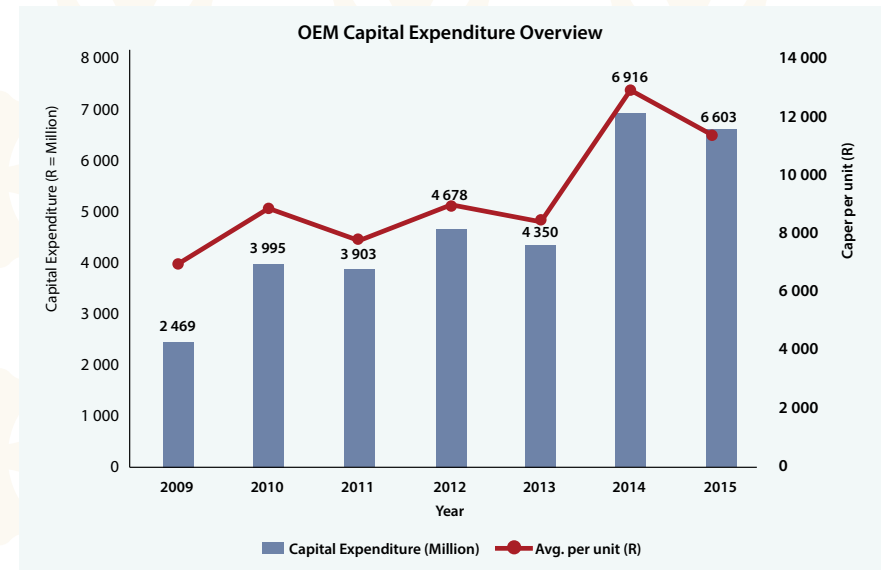
State support - mainly through the Automotive Production and Development Programme (APDP) - has been a key element in sustaining and growing the automotive sector, as evidenced by the expansion of a number of assembly plants as well as large recent investments by newly-arriving OEMs.

Table 1: Key performance data

Activity	1995	2012	2015
Capital expenditure by OEMs	R847 million	R4.7 billion	R6.6 billion
Export value (vehicles and components)	R4.2 billion	R86.9 billion	R151.5 billion
Total vehicles exported (units)	15 764	277 893	333 802
Top vehicle export destinations	1. China 2. Zimbabwe 3. Malawi	1. USA 2. UK 3. Algeria	1. UK 2. USA 3. Australia
Top automotive components exported	1. Stitched leather seat parts 2. Catalytic converters 3. Tyres	1. Catalytic converters 2. Engine parts 3. Silencers/ exhaust pipes	1. Catalytic converters 2. Engine parts 3. Tyres
Top vehicle countries of origin: imports	1. Germany 2. Japan 3. UK	1. Germany 2. India 3. Japan	1. Germany 2. India 3. Korea
Productivity (avg. no. of vehicles produced per employee)	10.0	18.5	19.7
Automotive industry contribution to GDP	6.5%	7.0%	7.5%
No. of passengers car model derivatives	354	2 159	2 872
Export destinations for vehicle and components	62	152	140
Total vehicles produced (units)	389 392	539 538	615 658
Total new vehicle sales (units)	399 967	624 035	617 749
No. of model platforms	41	13	13
Models with production volumes > 40 000 units	0	5	5

Source: the dti

Figure 1. OEM Capex



Source: NAAMSA (2016)

The confidence demonstrated by the recent investments made and announced by OEMs clearly attests to South Africa's continuing appeal as an important location for automotive manufacturing – a direct result of dti industrial policy. Approximately 113,000 people were employed in local automotive assembly and component production in 2015, a similar level to the previous year.

Whilst the automotive sector in South Africa has grown in the past two decades, some significant challenges remain; and have resulted in the industry struggling to increase vehicle production volumes and achieve higher levels of local value-addition in line with the APDP vision. One such major challenge is the sub-optimal competitiveness of domestic suppliers who have to compete with suppliers with much greater economies of scale from such locations as Thailand.

Exports

The South African automotive industry's export earnings for 2015 increased by 30.9%, to a record R151.5-bn, compared with the R115.7-bn reported in 2014. R7.8-bn in incentives was disbursed through the APDP, which unlocked R28.5 bn in investments by original-equipment manufacturers (OEMs).

The total number of vehicles exported has increased since 2013 (the year the APDP was implemented). Toyota has been the major exporter but in 2015 and 2016 Mercedes-Benz drastically increased its export market penetration with the new C-class (the W205 model) which was launched mid-2014.

Table 2. Performance of Mercedes-Benz SA

MBSA	Manufacturer	2012 Year	2013 Year	2014 Year	2015 Year	2016 Year
Domestic Sales	Units	30,269	31,938	36,958	32,705	29,674
	Average monthly sales	2,522	2,662	3,080	2,725	2,473
	Y-on-Y Growth		5.5%	15.7%	-11.5%	-9.3%
Exports	Units	49,826	36,229	32,767	93,435	109,797
	Average monthly exports	4,152	3,019	2,731	7,786	9,150
	Y-on-Y Growth		-27.3%	-9.6%	185.1%	17.5%

In 2015 and 2016, Mercedes-Benz was the single largest exporter of vehicles. In 2016, it exported an average of 9,150 units per month - significantly higher than the next-following exporter at 5,745 units per month.

Table 3. Other key export performance numbers for major auto OEMs

Exports by Manufacturer	2012 Year Basket share	2013 Year Basket share	2014 Year Basket share	2015 Year Basket share	2016 Year Basket share
BMW Group	12.0%	19.6%	21.8%	19.1%	16.5%
Ford Motor Company	11.5%	12.5%	16.3%	11.5%	15.3%
Mercedes-Benz SA	17.9%	13.1%	11.8%	28.0%	31.8%
Nissan	5.9%	5.4%	5.3%	2.7%	1.8%
Toyota	31.7%	29.0%	23.4%	17.1%	13.5%
Volkswagen group SA	19.5%	18.8%	19.7%	19.9%	20.0%
Others	1.5%	1.6%	1.7%	1.7%	1.1%
	100.0%	100.0%	100.0%	100.0%	100.0%
Total Exports	277,992	276,404	276,936	333,847	344,859

Short to Medium term actions

Competitiveness Improvement initiatives

These will continue to be implemented under the Automotive Supply Chain Competitiveness Initiative (ASCCI) to reach tier 2 and tier 3 suppliers, increasing efficiency and value addition along the entire value chain.

Automotive Master Plan

During 2017 the Department of Trade and Industry will seek to finalise the Automotive Master Plan and take the relevant proposals to Cabinet. The Master Plan development process began in April 2016 and is aimed at developing an industry vision and relevant policy proposals that should support future industry growth in line with the 9-point plan and the National Development Plan.

To upscale the impact of state interventions, **the dti** decided to develop a more comprehensive approach to the development of the automotive industry considering global and regional dynamics and trends as well as domestic market conditions. (Hence the Automotive Master Plan). It can be expected therefore that proposed interventions from the Master Plan will be wide-ranging and include considerations for improved performance monitoring and evaluation, market development, skills development and competitiveness improvement.

For the proposed policy interventions to succeed, **the dti** will seek the cooperation of all key stakeholders, with improved stakeholder management and regular, coordinated interactions with the OEMs' top leadership.

Key Opportunities

- Preferential procurement by the state;
- Regional market development;
- Global collaboration in supplier development;
- Localisation of selected components/products.

Constraints

- Input costs;
- General competitiveness gap between South Africa and other competing locations.
- Relatively small domestic market.

CASE STUDY: Supreme Spring

SUPREME SPRING, a Division of Metindustrial (Proprietary) Limited, is a manufacturer and supplier of original equipment hot and cold formed suspension springs to the South African motor industry and selected distribution outlets in Europe, the Middle East, Far East, Australasia and the US. The company's beginnings date back to 1958 and it has grown steadily to cater for the stringent quality and technical demands of the motor industry.

Supreme Spring engages in design, manufacture, marketing and supply of heat-treated steel component to the automotive market. It offers hot formed and cold formed coil springs, leaf springs, and torsion bars; stabiliser bars, including hollow bar and special spring products such as active ride control bars. The company is based in Nigel.

WCM project scope

The benchmark assessment identified fixed cost reduction, people optimisation and reliability linked to material availability. The scope was therefore developed to include a focus on both changeover reduction and fixed cost reduction. An improvement in changeover times would help reduce fixed costs and also optimise the use of people with regard to changeover-related processes.

Improvement summary per plant

- Plant 1: Changeover times were reduced by 41%; with a further 8% reduction easily achievable.
- Plant 2: Improved by 25%. Some of the implementation items are work-in-progress and due to the costly nature of their implementation, budget considerations had to be made for the following financial year. A further 38% reduction in changeover can be achieved as a result.
- Plant 3: New tool design and the implementation of an improved setup method will result in improvements >45%.



CASE STUDY: Feltex Trim GaRankuwa

FELTEX AUTOMOTIVE is a division of KAP Manufacturing Proprietary Limited, a 100% subsidiary of KAP Industrial Holdings Limited. The Automotive Division comprises seven business units that supply products directly and indirectly to the South African OEMs with its Head Office in Durban. This Division is now one of South Africa's largest automotive component manufacturers with manufacturing facilities situated in Durban, Rosslyn (Pretoria), Ga-Rankuwa (Pretoria), Port Elizabeth and East London, near the assembly plants to facilitate "just in time" and "just in sequence" supply.

This Feltex business unit is the supplier of a wide range of automotive acoustic and trim components, including main floor carpets, dash insulators, engine and passenger compartment insulators, trunk packages, parcel shelves and sun visors, shower curtains, seat back trim, trunk mats, roof and bonnet liners, exterior textile and wheelhouse liners. It is a first-tier supplier to all the leading OEMs and is the dominant supplier in its product range. Feltex Automotive employs 1,720 people (FY 2015) and produces 18.5 million components annually, resulting in 8% of total group revenue.

In line with Feltex Trim's objective to improve competitiveness, it was identified that facility downtime due to breakdowns and data capture methodology was excessive and productivity levels were adversely affected by regular disruptions. Therefore, the project scope was to improve maintenance activities through more detailed preventative maintenance, breakdown response, information accuracy and management of resources. The second objective was to improve productivity through standardised work improvements and "one-piece flow" principles.

Key project results were:

- Production time lost to machine breakdowns improved by 27%
- Overtime as a percentage of employee cost decreased by 48%



CASE STUDY: Widney Transport Components

WIDNEY TRANSPORT COMPONENTS was formed in the early 1950s and has established itself as the leading sliding window designer and manufacturer in Southern Africa. In 1996, Widney was bought by Shatterprufe, a member of the PG Group. Widney manufactures aluminium framed windows for South African automotive, rail and bus industries. Using quality toughened glass, Widney employs sophisticated machining and bending equipment to fit aluminium frames to windows to OEM specifications. The aluminium framed windows are supplied into the following sectors of SA's transport industry:

Automotive: OEMs and aftermarket;

Bus: All the major bus manufacturers and panel van converters;

Rail: Mainline, metro and locomotive.

The business, located in Alrode, Johannesburg, is the only local accredited sliding window supplier for leading automotive brands such as Toyota, Ford, Daimler Chrysler, General Motors and Nissan.

WCM project scope

The initial assessment at Widney identified customer credits as an opportunity for improvement, which in turn related to product quality. The scope of the project was to focus on both internal and external quality control measures to reduce both internal reject and customer return rates. The reduction and elimination of unnecessary process costs was also added to the overall scope of the project.

Project outcomes

- Customer PPM's reduced from 9,000 to 0.
- Internal rejects improved by 13%, with a projection to reduce them by a further 51%.



Key Action Programme

1. Competitiveness Improvement Initiatives: World Class Manufacturing (Phase 3)

The third phase of the WCM programme builds on the interventions delivered over the two previous IPAP periods and seeks to further expand reach through targeting more tier 2 and tier 3 firms (40 targeted) as well as black-owned suppliers. The programme will again be delivered under the auspices of the Automotive Supply Chain Competitiveness Initiative (ASCCI).

Nature and purpose of intervention

This intervention will extend competitiveness improvement support to automotive suppliers in strategic value chains, with a focus on lower tier and black-owned suppliers. Support is based on the methodologies tested and honed in the first two phases of the programme.

Targeted outcomes and impacts

The adoption of best practices and technologies by these automotive suppliers, which will be monitored at both a supplier project level as well as at an industry programme level, with enhanced competitiveness expected to support localisation, exports, and ultimately employment.

2017/8 Q1: Supplier enrolment complete.

2017/8 Q2: Assessments report and projects identified.

2017/8 Q3: Implementation progress report.

2017/8 Q4: Final assessment report and Case Studies.

Lead departments / agencies: the dti, ASCCI

Supporting departments/ agencies: EDD, IDC, Provincial Governments, UNIDO

2. Clothing, Textiles, Leather & Footwear

Situational analysis

The Clothing, Textiles, Leather and Footwear (CTLF) sectors have been major areas of government focus due to the potential they have for economic development and the creation of decent and sustainable jobs. To sharpen the focus of state support to an industry under severe attack from cheap inputs, the dti introduced the market-neutral Clothing and Textiles Competitiveness Programme (CTCP) in 2009 as a replacement for the previously existing Duty Credit Certificate Scheme (DCCS).



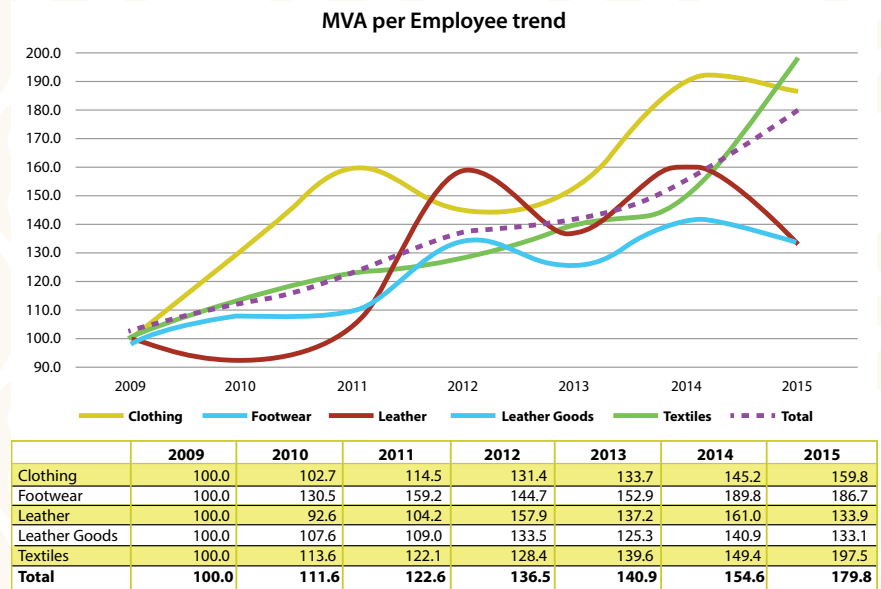
Government also designated the CTLF sectors at 100% local content under the revised Preferential Public Procurement Framework Act (PPPFA) in 2012 to assist local manufacturers to build competitiveness and capacity through secured market access to public entity consumption.

The CTCP programme - which is subdivided into the Production Incentive Programme (PIP) and the Competitive Improvement Programme (CIP) - has seen stability being achieved in the four sectors. As at 31 August 2016 a total of R 4.2 bn had been approved under the PIP and R3.3 bn already disbursed to the industry. CIP had a total of R720 million in approvals, of which R416 million had been disbursed to the different clusters participating in the programme.

From the R3.7 bn disbursed to industry, manufacturing value-addition of R 4.4 bn has been achieved and 9,550 net additional jobs created. The rate of on-time, in-full deliveries (OTIF) - one of the most important indicators of operational efficiency and customer service - increased in all sectors, indicating steadily improving delivery reliability from all 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 processes, products and people as well as in marketing.

Analysis of manufacturing value added per Employee is shown in Figure 1 below, derived from the CTCP Monitoring and Evaluation Database as at 1st December 2015.



Source: M&E the dti CTCP Desk at IDC (2009 – 2015)

The CTCP is acting as a confidence-boosting catalyst in the CTLF sectors, where more and more technology is being introduced and the signs are that all the sectors are moving steadily towards becoming globally competitive – one of the key defining objectives of the CTCP incentive.

The cotton value strategy was finalised and is being implemented through the Sustainable Cotton Cluster, with the full support of all stakeholders. The Textiles and Clothing Development Council (TCDC) - which will replace the SASTAC - is well on the way towards establishment after several workshops undertaken by the Steering Committee appointed by the Minister towards the end 2015.

Improvements in the global competitiveness of the CTLF sectors have enabled them to enter export markets in direct competition with countries like China and India, who have of course been dominating these markets for a very long time.

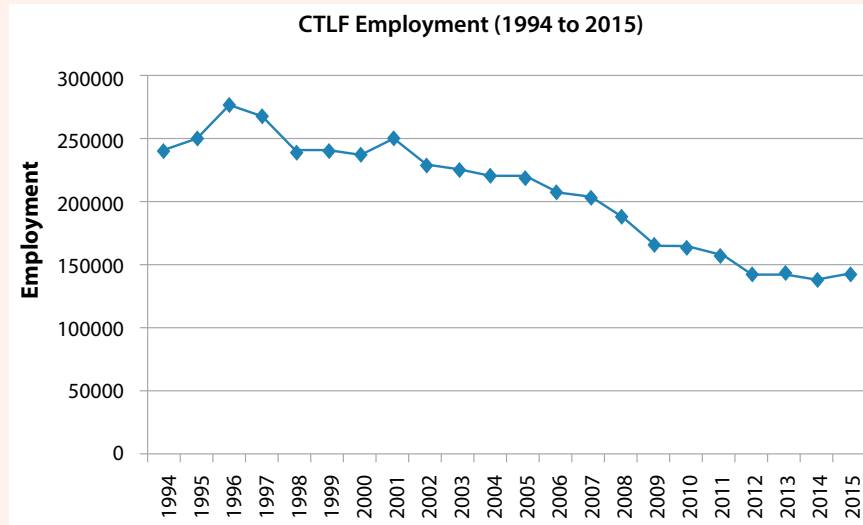
The main challenge for the CTLF sectors is the current shortage of liquidity in the CTCP fund. The programme has been so successful that more and more companies are participating, putting great strain on its ability to support newcomers.

Sector economic data

Variable	% of Manufacturing
• CTLF GDP	2.9 %
• CTLF Employment	10.45 %
• CTLF Output	3.5 %
• CTLF Wages	4.23 %

Source: Quantec

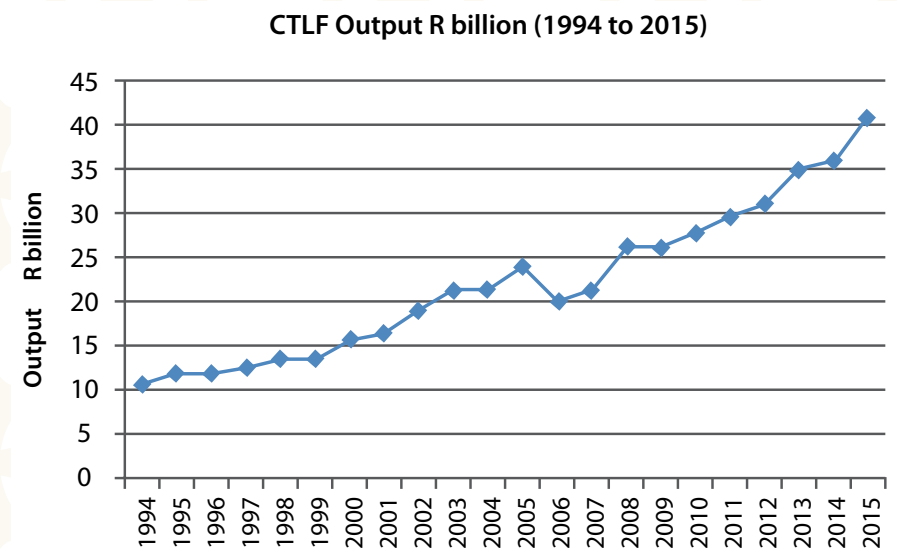
Figure 2 Employment: Formal & informal In CTLF from 1994 to 2015



Source: Quantec database

Though CTLF employment trends showed sharply falling employment across the sector from as early as 2002, the tide of job losses had been stabilised by 2012. Recent employment figures confirm an increase in employment, from 137,816 people in 2014 to 143,719 in 2015. (i.e. 5,903 new job were created in the CTLF sector in 2015).

Figure 3: Growth in CTLF annual real output from 1994 to 2015



Source: Quantec database

Real output grew by 13.93% from R 26.0 bn in 2009 to R 40.7 bn in 2015. There has been a steady increase in the output of leather and leather goods, with the footwear sector accounting for the establishment of 28 new factories over the past two years.



CTCP: textile industry revitalisation

CASE STUDY: Labora Shoes (Pty) Ltd

Labora Shoes is a “proudly South African” family-run business based in Durban, KwaZulu-Natal. Founded by the late Mr. Johnny Parboo in 1988, with just R11,000 in investment capital and a single machine, its aim was to service small independent retailers. The business has since grown from an initial production run of 2,500 pairs of shoes to more than 200,000 pairs of shoes per month - with a greatly increased range to suit the changing world of fashion and retail demand. The factory is adept at quick turn-around on orders and quick style changes.



CEO Desmond Chunderlal has clocked up 27 years’ experience and manages production planning, management, quality control, outsourcing and logistics. He focuses on the long-term strategy and creating stakeholder value. In order to meet rapidly increasing retail demand, Labora acquired two new buildings accommodating world class manufacturing machinery – with the help of a Production Incentive of R10.3 million made available by the dti covering the period 2012 to 2016. The clicking department was upgraded with a CNC Auto Die-Cutting machine - also through the PI Grant – and is able to cut 4,000 pairs per hour. Footwear production, sales revenue and employment all increased substantially from 2012 to 2016.

EMPLOYMENT GROWTH AND PARTNER SMMEs

EMPLOYMENT GROWTH AND PARTNER SMMEs					
LABORA SHOES (PTY)LTD	2012	2013	2014	2015	2016
Production million pairs / year	1.1	1.7	2.5	2.9	3.7
Sales revenue R million / year	41.1	55.9	79.8	96.8	145.5
Labora Shoe’s employment	212	227	290	375	412
LABORA SMMEs					
SPARE INVEST 30 CC	99	136	172	146	222
AFRICAN LEATHER FOOTWEAR CC	41	84	88	87	140
RNT FOOTWEAR	0	10	15	18	20
KRES FOOTWEAR	0	0	15	22	30
SASSAPI	78	102	162	202	220
NDSS	0	0	0	45	48
SMMEs: EMPLOYMENT GRAND TOTAL	430	559	742	895	1092
LABORA SHOES (PTY) LTD & SMMEs EMPLOYMENT	642	786	1032	1270	1504

CASE STUDY: Labora Training Centre growth

LABORA has always been committed to improving the lives of its employees, in line with the company's motto "*Knowledge is Power*". At one point in its development, it was faced with a severe shortage of skilled labour due to the retirement of a generation of employees. The company responded by setting up the Labora Training Centre to offer skills and training to young people and encouraging them to join Labora. This initiative provides a comprehensive, innovative and unique programme that equips the employed as well as the unemployed with high-end skills and techniques in shoe making. The student intake increased from 16 in 2013 to 50 in 2016. In July 2013, the Centre took a step closer to its vision by joining hands with the FP&M SETA and The MRP REDCAP FOUNDATION to provide extended skills development services to the footwear industry.

KZN Sub-National Footwear Cluster

The Sub-National Cluster set up between Labora Shoes, Smiley's Footwear and Mr Price was approved in 2014, with grant funding of R45 million from **the dti's** Competitiveness Improvement Programme (CIP), and is now fully operational. Both the anchor cluster members and their associated SMEs have seen the benefits of intensive investment in cutting-edge equipment for improved manufacturing competitiveness. The Cluster has a 3D CAD / CAM Design Studio with some of the best design software available on the international market, and has been able to provide training in design, pattern making, grading, pattern testing, last making, clicking, closing and making. The flexibility of the cluster system has been instrumental in producing smaller orders with intricate designs. With the instalment of new MRP systems, there have also been significant reductions in tooling costs, turnaround time and more effective stock control.



Labora Exports

Labora Shoes has been able to showcase its goods through a number of **dti** pavilions – e.g. Dubai, Europe, Germany, Las Vegas, Zambia and Australia - as well as in Mr Price shops. In 2015, Labora entered into a Joint Venture with a company in Nigeria to manufacture footwear since Nigeria does not allow fully assembled shoes except sports footwear to be imported into the country. Labora sends through all the components which are then assembled and finished in Nigeria.

Labora Social Responsibility

The company is registered with Sedex, which offers an electronic system for collecting and analysing information on ethical and responsible business practices. Labora Shoes has been involved in many charitable organisations in Chatsworth, Mariannhill, Tongaat and surrounding areas. It supports programmes such as Chatsworth Child Welfare, The Rotary Club in Chatsworth and The Haven of Rest which is a rehab, frail centre and orphanage. In partnership with NSM in Pinetown, Labora established a Breakfast Kitchen where +-100 homeless men and women gather to enjoy a hot bowl of porridge and coffee at 6:00 every morning, and sandwiches which they carry home.

CASE STUDY: Gelvenor – High-performance parachute manufacturer

By specialising in high performance fabrics, **GELVENOR TEXTILES** survived a brutal industry shakeout and built a business that now exports to 27 countries around the world... including China.



“China hurt our textile industry but we succeeded,” said Gelvenor CEO Dicky Coetzee.

South Africa’s textile industry employed more than 200,000 people in 2001. That number has since fallen to 80,000, but – thanks to targeted **dti** support - largely stabilised Gelvenor has thrived where many others failed by choosing to compete with global textile giants on quality rather than price, innovating constantly to develop existing fabrics.



“We use the Apple (AAPL, Tech30) model -- they didn’t invent the cellphone but they mastered its use - and that’s what we do when we innovate,” said Coetzee.

Gelvenor is based near Durban and employs 280 people. The company recently patented what it calls “revolutionary” fabric used to run conveyor belts in the mining sector. It hopes to secure local and international clients.

Gelvenor has had most success in the field of aeronautical fabrics -- used to make parachutes and hot air balloons -- ballistic textiles and fire resistant materials. It was the first company in the world to manufacture low bulk, low volume parachutes and the first to use microfibre parachute yarns.

The parachute fabric is “thinner, lighter and stronger,” which appeals to sports enthusiasts and the military, Coetzee said. Gelvenor’s parachute material is popular with sports enthusiasts and military customers.

Gelvenor, based in Hammarsdale near Durban, began life in 1965 manufacturing synthetic fabrics. It now employs 280 people with annual sales of \$28 million -- that’s up 50% in five years, according to Coetzee. Its biggest markets are Russia, the United States, Israel, Australia and China. The Middle East was also important, but demand collapsed in tandem with oil prices since 2014.

U.S.-based *Performance Designs* was the biggest buyer of Gelvenor parachute fabric in 2016. The South African firm also supplies Russia’s space program.

Key Action Programmes

1. CTCP Impact Monitoring

Nature and Purpose of the intervention

The Monitoring and Evaluation Tool was developed by the IDC CTCP Desk in 2015 which is used to monitor progress of the CTCP and its impact on manufacturing value-add, new jobs being created through the programme, global competitiveness of the companies participating in the programme and growth in the different sectors.

Targeted outcomes

Reports will be generated on the increased impact on job creation, growth, stability and global competitiveness.

Key milestone

2017/18 Q2 and Q4: Bi-Annual Reports to highlight the impact of CTCP on job creation, growth, stability and global competitiveness.

Lead departments/agencies: the dti

Supporting department/agencies: IDC, EDD

2. Beneficiation of local Raw Hides through export prohibition

Nature and Purpose of the intervention

South Africa is one of few countries that enjoy a leather value chain with capabilities that should be treasured. This value chain can support rapid growth in exports from rejuvenation of the footwear industry and a globally competitive automotive leather industry.

Sector research identified a “leakage” of good quality raw materials from the early stages in the value chain. Some 55% of bovine hides leave the country under-beneficiated. Thus, the leather industry must rely on substantial imports of quality hides to supplement the shortage of local quality hides. This plays in the hands of competitor countries to the detriment of the downstream industries in South Africa.

On 26 May 2016, the National Treasury presented a “Draft Guidelines on Export Taxes”. Based on the guidelines and procedures **the dti** on behalf of all stakeholders will pursue execution of ban on the exports of “raw hides” and export duties on the semi-finished “wet blue” (full substance, grain split and drop slit) aimed at effective diversion of the leather raw and semi-finished resources for downstream value addition.

Targeted outcomes

Development of local substitutes for imported leather and leather goods. Also, to divert raw and semi-finished leather to existing local downstream firms for beneficiation, thus creating more local employment in the leather sector.

Key milestones

2017/18 Q1: Submission of application to National Treasury.

2017/18 Q2: Execution of the recommendations by National Treasury through due processes.

2017/18 Q3: Monitoring & Evaluation of post leather export prohibitive policy execution.

Lead departments/agencies: the dti, National Treasury, NFLC

Supporting departments/agencies: EDD, ITAC, FP&M SETA, TEI's, DAFF

3. Establishment of Exotic Leather Goods Quick Response (QR) Design Studio in New York

Nature and Purpose of the intervention

The US market for luxury goods made from exotic leather is growing rapidly. However, there remain geographical and time zone barriers to be overcome, coupled with administrative delays caused by CITES permits and import barriers into the USA. A Quick Response (QR) design studio and sample-making rapid design prototype facility will seamlessly integrate a Cape Town-based design facility with the New York studio, leading to a substantial reduction in time to the market and improved sampling efficiency.



Targeted outcomes

The establishment of an Exotic Leather Goods Quick Response (QR) Design Studio in New York for rapid prototyping will facilitate transfer of skills, design and fashion trends from New York to Cape Town design facility. The QR facility is expected to lead to a substantial increase in manufacturing export orders of high value-added exotic leather luxury goods.

Key milestones

- 2017/18 Q1: Finalise funding through **the dti** CIP grants.
- 2017/18 Q3: Establish Exotic Leather Goods Quick Response (QR) Design Studio in New York.

Lead departments/agencies: the dti, IDC CTCP, ELSA

Supporting departments/agencies: EDD, NFLC, UP

4. Leather Processing Hub

Nature and Purpose of the intervention

The Leather Processing Hub will be established in Pietermaritzburg, led by the Department of Economic Development Tourism & Environmental Affairs (EDTEA, KwaZulu-Natal) in collaboration with the dti and leather industry stakeholders.

Targeted outcome

The main outcome of the programme will be the establishment of a Sheep Skin Commercialisation Pilot Plant in collaboration with the local leather industry and supported by the Centre for Footwear & Leather Goods Entrepreneurship (CoFE), Incubation Support Centre (ISC), Information Technology Centre (ITC) and Factory Shops (Kiosk).

Key milestones

- 2017/18 Q1- Engineering design development of the Leather Processing Hub site and investment promotion by KwaZulu-Natal EDTEA, in collaboration with the dti.
- 2017/18 Q2 to Q4: Building the infrastructure, using funds made available by the KwaZulu-Natal EDTEA and **the dti**.

Lead departments/agencies: the dti, KZN EDTEA

Supporting departments/agencies: EDD, DUT, VUT, FP&M SETA

5. Establishment of Footwear & Leather Goods Component Sub-National Cluster

Nature and Purpose of the intervention

The share of footwear manufacturing in local aggregate demand increased from 44.6 million pairs in 2011 (18% localised) to 58 million pairs in 2015 (25% localised). Over the same time period, exports grew from 2.6 million pairs to 4.1 million pairs. With a strategic target of achieving 40% local market share and 15% export orientation, the footwear industry needs to grow by over 15% annually. However, to achieve such a growth rate the footwear component-manufacturing industry must grow by over 20% annually.

Through stakeholder consultation with the footwear component-manufacturing industry, it has been agreed to establish a sub-national component cluster. This will enhance collaboration, advanced technology demonstration and supply chain capabilities in the further growth and development of the downstream footwear and leather goods industry.

Targeted outcomes

The main outcome of the programme will be the establishment of a Communal Hides Commercialisation Pilot and transformation of communal leather off-take through a joint venture between the leather industry, a communal skills-development facilitator and the relevant communities. The main impact of this intervention will be better slaughtering practices by communal farmers, which will generate better quality fetching higher market prices.

Key milestones

2017/18 Q1: Finalise funding through dti CIP grants.

2017/18 Q3: Implementation Footwear & Leather Goods Component Sub-National Cluster.

Lead departments/agencies: the dti, IDC CTCP, NFLC

Supporting departments/agencies: EDD, NFLC, VUT

6. Establishment of Footwear & Leather Goods Fashion Hub (Sub-national Cluster)

Nature and Purpose of the intervention



Within the fashion value chain “Leather means sophistication”; and it plays an important role in the fashion and furniture industries, especially because it is a natural raw material of high added (and perceived) value.

The development of a Footwear and Leather fashion value chain is particularly important considering the excellent progress registered in 2013 and 2014 by the Leather & Footwear sectors.

Targeted outcomes

Co-operation mechanisms linking the various stakeholders, making the most of the sector’s potential in fashion-related production chains, from stylists and designers to leather products. Key outcomes will be integration, sharing of creative intelligence and technological innovation.

Key milestones

2017/18 Q1: Finalise funding through the dti CIP grants.

2017/18 Q3: Implementation Footwear & Leather Goods Fashion Hub Sub-National Cluster.

Lead departments/agencies: the dti, IDC CTCP, NFLC, DUT

Supporting departments/agencies: EDD, FP&M SETA

7. Designated Clothing & Textile Retailer Supplier & Enterprise Development

Nature and purpose of the intervention

To provide a solution that will enable clothing and textiles retailers to meet their enterprise and supplier development obligations through contributing to SME incubation and the industrial activities of national and sub-national clusters

Targeted Outcome

Amended scorecard criteria for clothing and textile retailers' ESD spend.

Key Milestones

2017/18 Q2: Working closely with BB-BEE firms to develop an amended scorecard for the clothing and textile retailers regarding Enterprise Supplier Development (ESD) spend.

2017/18 Q4: Proposal for a revised scorecard presented for approval.

Lead departments/agencies: the dti

Supporting departments/agencies: EDD

8. Cotton Subsector Development Strategy

Nature and purpose of the intervention

The National Cotton Sector Strategy was completed in in 2016. It has profound potential for retail sector import replacement and for filling manufacturing capacity gaps and creating employment. Specific subsector strategies - for example cotton spinning - will be developed to give additional structure to implementation activities.

Targeted Outcomes

Subsector Strategies to guide industry value chain development and capitalisation.

Key Milestones

2017/18 Q1: Subsector strategy research completed and draft strategies developed.

2017/18: Q2 Public and private sector engagements completed.

2017/18 Q4: Strategies presented and approved by **the dti**.

Lead departments/agencies: the dti

Supporting departments/agencies: EDD, DAFF

9. Retail -Driven Integrated Supply Chain Programme (ISCP)

Nature and purpose of the intervention

To provide an implementation mechanism through which retailers will systematically replace imports with fully integrated local value chains. The ISCP business model was successfully demonstrated in the Sustainable Cotton Cluster.

Targeted Outcome

Implement ISCPs with 4 leading local clothing retailers.

Key Milestones

2017/18 Q2: Retailer engagement completed.

2017/18 Q4: ISCPs implemented and operational.

Lead departments/agencies: the dti

Supporting departments/agencies: EDD

10. Regional Cotton Textile and Development Strategy

Nature and purpose of intervention

To formulate a strategy that will guide bilateral industry value chain capacity development initiatives with BLNS countries and other SADC countries.

Targeted Outcomes

A formal position on regional cotton textile and apparel industry value chain development as a basis for bilateral development agreements with other Southern African countries.

Key Milestones

2017/18 Q2: Strategy research completed and draft strategy developed.

2017/18 Q4: Public and private sector engagement completed.

Lead departments/agencies: the dti

Supporting department/agency: EDD

11. Value Addition to transform locally manufactured quality mohair into processed tops, yarns and finished products for local and export markets

Nature and Purpose of the intervention

Ongoing technological innovation and development in raw material mohair fibre yield, fibre quality and fibre availability, based on sustainable practices and procedures to establish SA as a significant contributor and preferred supplier to global mohair value chains.



Targeted Outcomes

A strong mohair sector strategy, through engagement with the broader mohair industry to develop sustainable long term practices to improve fibre quality and value addition.

Key Milestones

2017/18 Q2: Mohair sector stakeholder engagement.

2017/18 Q4: Develop at least one Integrated Supply Chain, processing South African mohair into a finished product.

Lead departments/agencies: the dti

Supporting departments/agencies: IDC, EDD

3. Metal fabrication, capital & rail transport equipment

Sector profile

The metal fabrication, capital and rail transport equipment cluster of sectors includes:



1. Ferrous Metals

The Ferrous Metals sector is both upstream and downstream. The upstream sector consists of the primary iron and steel (carbon and stainless) industry - flat-rolled products: coil, sheets, plate; and long products: reinforcement bars; wire rod and scrap metals. The downstream sector includes fabricated metal products (e.g. tube 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.

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 and construction. The minimum lifespan of capital equipment is three years, excluding consumables. Capital equipment is largely used in mining, manufacturing and infrastructure development.

4. Rail Transport Equipment

The South African rail industry has been in existence for over 100 years remains one of SA's major manufacturing sectors. The Rail Transport Equipment (RTE) sector consists of the following sub-sectors:

- Rail infrastructure: permanent way, civil engineering, power supply, signalling, engineering and consulting services;
- Rail rolling stock: manufacturing and assembly of locomotives, wagons, electric multiple units and coaches for the movement of passengers and freight.

The rail recapitalisation programme – and the opportunities it provides for leveraging and deepening local industrial capabilities – is a major government priority. Key to this effort is the full implementation of rail designations, at the following levels of local content:

- Rail signalling - 65%;
- Rolling stock at varying local content thresholds:
 - Diesel locomotives - 55%;
 - Electric locomotives - 60%;
 - Wagons - 80%;
 - Electric Multiple units - 65%.

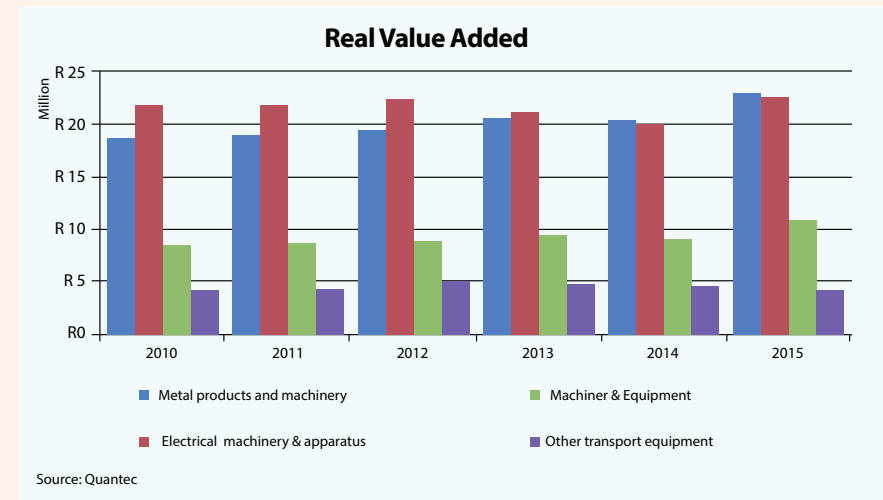
Sector Economic Data

Variable	Contribution in 2015
Manufacturing Value-Add (% of GDP) <ul style="list-style-type: none"> • Basic Iron and Steel and Non-Ferrous Metals¹⁷ • Metal Fabrication, Capital and other Transport equipment¹⁸ 	R35.1 billion (0.87%) R61.3 billion (1.52%)
Manufacturing Employment (% of Manufacturing) <ul style="list-style-type: none"> • Basic Iron and Steel and Non-Ferrous Metals • Metal Fabrication, Capital and other Transport equipment 	53 467 (4%) 328 086 (24%)
Trade Balance <ul style="list-style-type: none"> • Basic Iron and Steel and Basic Non-Ferrous Metals • Metal Fabrication, Capital and other Transport equipment 	R102.64 billion -R86.03 billion

¹⁷ Data for basic iron and steel and basic non-ferrous metals was abstracted from SIC 351 and 352 respectively

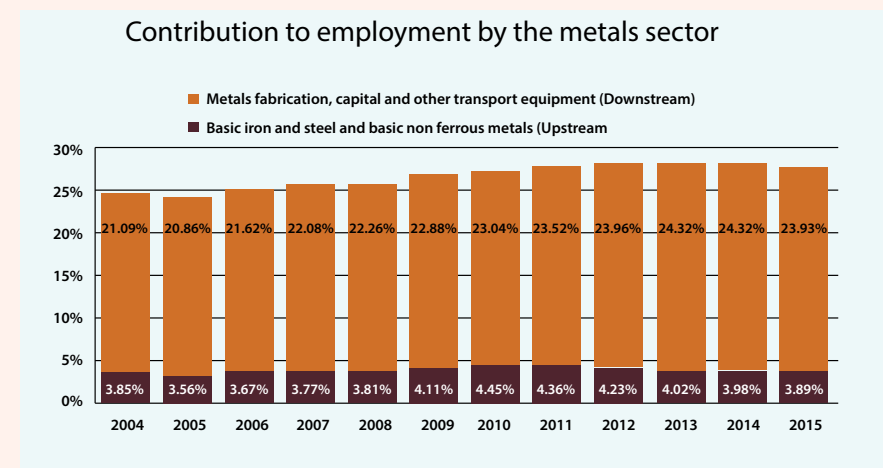
¹⁸ Data for Metal Fabrication, capital and other transport was abstracted from the following SIC codes: Metal products excluding machinery: SIC 353-355, Machinery and equipment: SIC 356-359, Electrical machinery and apparatus: SIC 361-366, Other transport equipment: SIC 384-387

Figure 1. Real value added, by sub-sector



The contribution to manufacturing employment by the metals industries remained stagnant in 2015 for both the upstream and downstream sectors - with the upstream sector contributing 4% to manufacturing employment and the downstream sector 24%.

Figure 2. Contribution to manufacturing employment

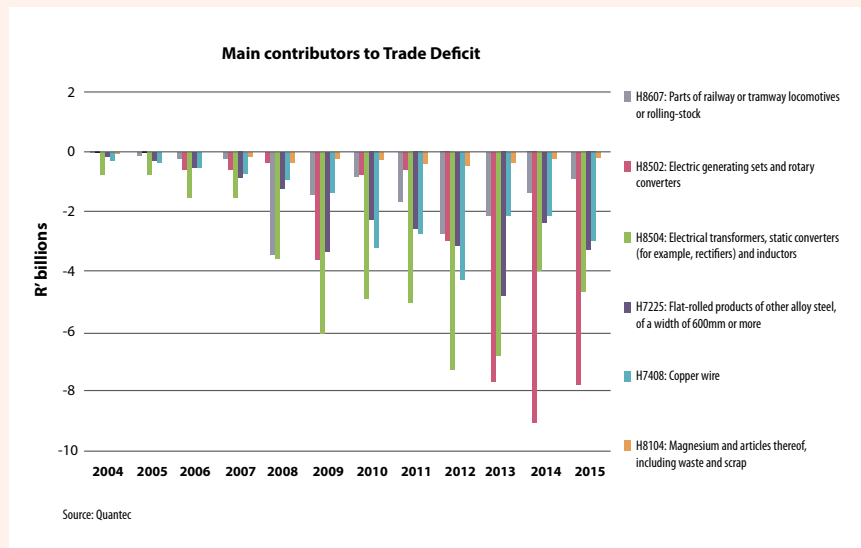


The trade deficit in the downstream industries continues to worsen, while the upstream industries lost some competitive advantage in export markets. This was particularly prominent in the steel sector, in a global environment characterised by massive over-capacity challenges and low steel prices.

The main contributors to the downstream industries' trade deficit are the following: electrical systems such as generators, rotary converters and transformers (largely associated with the Eskom built 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 rolled out.

Figure 3. Contribution to trade deficit



Constraints

- While Government has prioritised localisation, the following impediments persist:
 - Inconsistency in the implementation of the localisation programme and continuous increase in the importation of key components within the infrastructure build programme, particularly in the designated products/sectors.
 - In the rail signalling industry, major challenges are inadequate testing facilities and sub-optimal software engineering and development capacity to achieve the required safety integrity level 4 – which largely explains the continuing high import content in the sector.
 - The rail industry structure remains fragmented, resulting in huge gaps in the value chain.
 - Lack of standardisation in key products across state procurement undermines broader localisation efforts and the ability of the local industry to achieve competitive economies of scope and scale.
 - All the above points to a lack of policy alignment and coordination. Effectively, South Africa's largest rail and energy infrastructure expansion programmes have not translated into the development of robust local supply chains. Despite government intervention frameworks such as the Competitive Supplier Development Programme (CSDP), the National Industrial Participation Programme (NIPP) and the various designation programmes, local suppliers are yet to be significantly integrated into key OEMs' global supply chains.
- 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 steel mini-mills.
 - The competitiveness of the downstream industry continues to be undermined by sub-optimal port infrastructure and by the inefficiencies and high costs of road and rail transport (particularly the slow pace in the implementation of the branch-line rehabilitation programme).

3. Inefficiencies across the entire value chain:

- Three decades of low demand have led to low rates of capital investment, severely affecting the maintenance, upgrading and replacement of plant, machinery and equipment.
- 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 adequately capture new opportunities offered by both private and public capital expenditure programmes.
- There are significant skills shortages at artisan, technical, engineering and project management levels.
- Continued decline in capacity utilisation due to subdued global and domestic demand is further exacerbating the inefficiencies in the value chain.

Unequal trading platforms:

- Higher tariffs and non-tariff barriers in potential export markets. This is further exacerbated by slow recovery in global markets and implementation of 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-added, 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 or achieving higher impact include:

- The SA infrastructure-build programme - including the Strategic Integrated Projects (SIPS) - 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 pronouncement 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 the rail rolling stock suppliers into the global value chain of the OEMs.

- The maintenance programme for the newly procured EMU and locomotives will also provide opportunities once warranties have expired.
- The move towards the green economy presents an opportunity to implement energy-saving measures in the energy intensive industries and move towards conformance to environmental requirements.

New developments in the rail programme:

- China North Rail delivered 2 CKD diesel locomotives for final assembly at Transnet Engineering's Durban Facility.
- Transnet Engineering unveiled its locally manufactured Trans-Africa diesel-powered locomotive, specially designed for use on branch lines and in shunting yards. Transnet Engineering is an OEM in freight wagons and a major exporter of rolling stock equipment to the African market. In June 2016, TE supplied fuel tanker wagons and container wagons to Swaziland Railway and passenger coaches to Botswana.
- After exhaustive tests undertaken on the new PRASA-Gibela EMUs, PRASA accepted the first train in October 2016.



PRASA's test train

National Tooling Initiative

- The new Toolmaker Trade Test was accredited and the Master Toolmaker Qualification registered with SAQA.
- NECSA was accredited as the first national Trade Test Centre (QCTO/OQAC/16/0008). The trade testing process with Indlela commenced in July 2016 with the first group of students undergoing the final certification process.
- QCTO also accredited seven colleges (Northlink TVET College; College of Cape Town (TVET); Nuclear Skills Development Centre at Necsa; Denel Technical Academy; Tshwane South TVET College; Tshwane Leadership and Management Academy; and Coastal KZN TVET College) as Skills Development Providers for the new Tooling Qualification.

Progress made Under the National Foundry Technology Network (NFTN)

- Regulatory Compliance and productivity improvements:
 - NFTN intervened at several foundries by providing specialist environmental support to ensure that foundries comply with environmental requirements as set out in the National Environmental Management Act (NEMA).
 - These interventions averted foundry closures and ensured that 60 jobs were retained at the affected foundries.
 - The following foundries were provided with assistance: Olde World Foundry; Action Africa; JC Impeller and Qantas Foundry.
- Under the foundry efficiency and competitiveness improvement programme, the following support interventions were initiated by NFTN:
 - Sand management to reduce costs of disposal and improve the reclamation processes at McWade Foundry and Inkuzi Foundry.
 - Energy Management at Viking Foundry, which yielded a 60% saving on energy costs.
- Facility Layout to improve resource efficiencies and optimise layouts resulted in cost saving opportunities as well as labour productivity improvements at the following foundries: Ajax Foundry; Forbes Foundry and Melcast Foundry.

CASE STUDY:

The National Tooling Initiative Programme

The NTI Programme is a national multi-stakeholder initiative that was established in 2006 under the auspices of **the dti** and the Tooling Association of South Africa (TASA) to implement a turnaround strategy for the distressed SA tooling industry. The initiative has enabled and continues to enable government and industry to collaborate and coordinate large-scale interventions required to rehabilitate the Tool, Die and Mould-making (TDM) sector.



Western Cape Tooling Centre of Excellence with Trade Test facility

Up to now the Programme has achieved the following:

- The development and accreditation of new qualifications based on international standards; competency certification; articulation from TVET colleges to universities; modularity and part qualifications; employability skills; technology alignment; teaching capacity alignment; integration of theory, practical and workplace training.
- Development and maintenance 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.
- 100% placement of students at companies for on-the-job training, with more than 80% placement of toolmaker students in permanent jobs.
- Establishment of Centres of Excellence and Trade Test centres with state-of-the-art machinery and equipment.
- More than 100 TDM companies have been supported through the Enterprise Development programme in competitiveness improvement interventions.
- The development of the first business incubator at Riversands - a 'learning factory' to integrate newly skilled learners into SMME business.

CASE STUDY:

Collaborative platforms to develop industry capabilities and support the localisation drive

Over the past two years, three CSIR-hosted national programmes - the National Cleaner Production Centre of South Africa (NCPC-SA), the Technology Localisation Implementation Unit (TLIU) and the National Foundry Technology Network (NFTN) - collaborated to offer comprehensive support to one of the leading valve suppliers on the African continent, AVK Holding A/S – a Danish company which acquired a major stake in Premier Valves in 2014 – and its key castings suppliers.

Outcomes of the collaboration

- The NFTN assisted with identifying foundries with the best technical capability to meet AVK's operational needs. After the match-making process, NFTN provided support on simulation and casting processes to the selected foundries. As a result, AVK has localised castings through supplier development and technology transfer programmes.
- NCPC-SA applied its Resource Efficiency and Cleaner Production (RECP) Best Practice Guideline to assist AVK in its transformation into a "Green Plant", with reduced water and electricity consumption and reduction and re-use of waste.
- The provision of CAD software support facilitated by TLIU allowed AVK to enhance its manufacturing technology in support of the gate valves production line, which will replace imports. This collaboration has created a platform to collectively develop the industry's productive capabilities, contribute to creation of decent jobs, and deepen the localisation drive through technology and skills transfer programmes, resource efficiency and cleaner production. There is also an opportunity to replicate this collaboration in similar projects, maximising the impact of government-funded interventions across a range of industries.



Key Action Programmes

1. Designation and Localisation

Nature and purpose of the intervention

Government's strategic goal of revitalising the metal fabrication, capital goods and rail sectors by mandating 75% local content in public procurement can only be achieved by leveraging current and future government capital and operational expenditure programmes to facilitate the designation and standardisation 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 Eskom and industry on the implementation of the current power pylons and substation structures have revealed a need for a further breakdown of the designated items to provide clarity and simplification of the list.

At the same time, an important anomaly needs to be solved: electrical components covered by the current Instruction Note are also used in rail applications; but since the Note does not explicitly mention that it covers electric equipment in *all other applications*, procuring entities of rail infrastructure components continue to circumvent this instruction and almost exclusively import their required components.

Targeted outcomes

Leveraging the localisation opportunities as presented by the state infrastructure programmes:

- reduction of import leakage(s);
- increased investments in key manufacturing processes and activities for supply into the domestic market;
- improved capture of after-market opportunities;
- support for the revitalisation of lost manufacturing capacity;
- increased employment and exports.

Key milestones

- 2017/18 Q2: Finalise the Pumps and MV motors designation proposal with National Treasury.
- 2017/18 Q2: Finalise the industry analysis for possible designation of the rail infrastructure: permanent-way sector.
- 2017/18 Q3: Finalise the industry analysis on Pipe Fittings.
- 2017/18 Q4: Finalise the industry analysis for possible designation of port equipment.
- 2017/18 Q1-Q4: Develop and implement the rail rolling stock valve supplier development programme in collaboration with DST-TLIU and Transnet Engineering.
- 2017/18 Q1-Q4: Continuous support and monitoring of the designated products and sectors.
- 2018/19 Q2: Industry analysis for possible designation of switch gears and associated components.
- 2018/19 Q3: Revise the power pylon and substation structures and include additional components, as well as unbundling the currently designated components to provide further clarity to SOCs. Additional 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 the existing diesel locomotives.
- 2018/19 Q1-Q4: Continuous support and monitoring of the designated products and sectors.
- 2019/20 Q2: Review the rail rolling stock instruction note for streamlining and maximisation of local content thresholds.
- 2019/20 Q1-Q4: Continuous support and monitoring of the designated products and sectors.

Lead department: the dti

Supporting departments/agencies: NT, EDD, DST, IDC and SOCs

2. Continued competitiveness enhancements programmes deployed at company level, together with dedicated training

2.1 National Tooling Initiative (NTI) Programme

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 the lack of tooling development support, resulting in most products being manufactured in the Far East.

The primary outcome of the multi-stakeholder engagement was the National Tooling Initiative (NTI) programme. 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. As per the Case Study on the NTI, significant progress has been made under the skills development programme since the inception of the partnership between **the dti** and the tooling industry.

In 2016, the Master Toolmaker qualification was registered; 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. These include:

- The accreditation of additional trade test centres for the new Toolmaker Trade test (NQF level 5);
- To trade test all eligible students for the new Toolmaker Trade test (NQF level 5);
- 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, improve competitiveness in the sector; enhance capacity in South Africa's tooling industry skills upgrading, increase local content, promote investment in tooling manufacturing and increase employment.

Key milestones

2017/18 Q2: Develop and submit all the required documentation to QCTO and NAMB to facilitate the accreditation of the KZN Trade Test Centre.

2017/18 Q1-Q4: 40 eligible students to undergo trade testing on the new Toolmaker qualification.

2017/18 Q1-Q4: Implement competitiveness improvement programmes at 8 benchmarked TDM sector companies.

2017/18 Q1-Q4: Establish a pilot incubator to support the enterprise development programme.

2018/19 Q1-Q4: 120 eligible students to undergo trade testing on the new Toolmaker qualification.

2018/19 Q1-Q4: Benchmark 16 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 of the pilot incubator for entrepreneurial enterprise development in support of localisation.

2018/19 Q4: Master Toolmakers 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: Operational learning and business process training of the pilot incubator for entrepreneurial enterprise development in support of localisation.

2019/20 Q1-Q4: Benchmarking of 16 TDM sector companies.

2019/20 Q1-Q4: Intervention projects at 8 TDM sector companies.

Lead department(s): the dti and NSF

Supporting departments/agencies: EDD, NT, DST, DHET and NTIP, QCTO, merSETA, NAMB

2.2 National Foundry Technology Network

Nature and purpose of the intervention

The National Foundry Technology Network (NFTN) is an initiative of **the dti** and the industry that aims to revitalise the foundry industry through skills development and enterprise development. Its core aim is to reverse the erosion of the foundry industry, which has over the years negatively impacted on the competitiveness of the broader manufacturing sector.

Key negatives that emerged in 2016 – and which require coordinated remedial efforts across the three spheres of government and the industry – include the following:

- Inadequate order book volumes to sustain and improve production efficiencies and cost competitiveness;
- High product development and tooling costs impeding the industry's penetration into key demand sectors (e.g. rail and automotives);
- Inconsistent interpretations of environmental legislation by municipalities; and
- Lack of adequate electricity infrastructure and energy pricing.

Targeted outcomes

The NFTN is mandated to facilitate the development of a globally competitive South African foundry industry through appropriate skills training, technology transfer and diffusion of state-of-the-art technologies.

Key milestones

2017/18 Q1-Q4: 20 foundries assisted under the CII programme. CII programme will prioritise product development, energy saving measures, address environmental and waste management needs, as well as deepening the localisation of castings in key sectors.

2017/18 Q1-Q4: Facilitate dialogue and programmes between the DEA and the foundry industry to avert further foundry closures.

2017/18 Q1-Q4: Provide technical support to 5 foundries to obtain relevant accreditation.

Lead department: the dti

Supporting departments/agencies: EDD, 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 assistance from **the dti**, the jewellery sector has managed to increase exports over the past 5 years by more than 290%. In 2016, exports exceeded R1 bn. To achieve further growth, the Chinese market has been identified as holding very significant growth potential for jewellery sector exports.



Targeted outcomes

Increase market access for jewellery sector in the Chinese market.

2017/18 Q1-4: In conjunction with China-based FER and the local industry, investigate and identify a suitable jewellery exhibition in mainland China for possible participation by SA jewellery manufactures.

2018/19 Q1-Q4: Facilitate participation by South African jewellery manufacturers at a suitably identified Chinese exhibition.

Lead department(s): the dti

Supporting departments/agencies: EDD, SBD and SE

3.2 Gold Loan Scheme guidelines amendments

Nature and purpose of the intervention

Since its inception, the Gold Loan Scheme has not been able to disburse the allocated funds fully and therefore achieve its intended outcome. Despite the scheme being in place, access to finance for jewellers remains a major challenge.

Targeted outcomes

The intention of the review is to ensure that the challenges are fully identified and changes effected to improve access to the support programme and the industry's overall cost competitiveness.

Key milestone

2017/18 Q1-Q3: Develop a detailed proposal for the expansion of the Gold Loan Scheme to include other jewellery manufacturing, raw materials and the revision of qualifying criteria.

Lead department(s): the dti

Supporting departments/agencies: EDD, IDC

4. Agro-processing

Situational analysis

Agro-processing is the largest single subsector in manufacturing, and has shown relatively rapid growth in sales and employment over the past 15 years. It is a major source of exports, especially fruit juice, as well as covering key wage goods and some industrial inputs. It supports important areas of job creation and self-employment both upstream, in agriculture, and downstream, notably in retail and food services. Ensuring adequate, affordable basic foods both improves the quality of life for our people and helps moderate labour costs, effectively raising overall economic productivity.

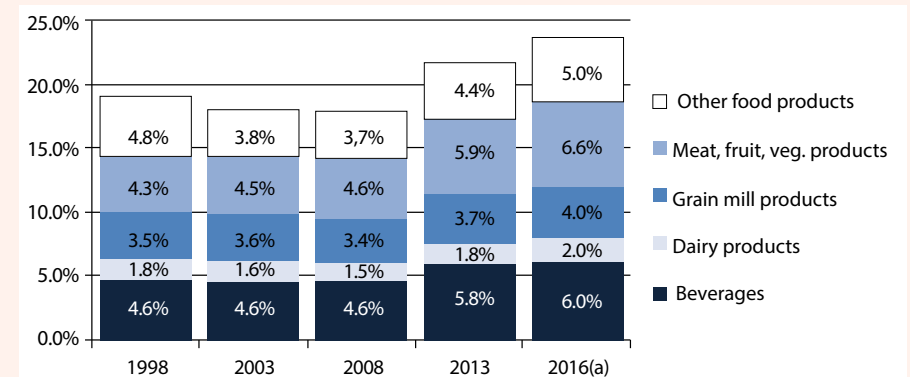


Agro-processing has been understood in the IPAP context to relate primarily to the production of food, beverages and industrial inputs except for wood and paper, which require their own interventions. This section therefore covers a wide variety of products with both cross-cutting and product-specific objectives and support programmes. In this context, three different groups of products emerge.

- South Africa exports some processed goods and niche agricultural products to overseas markets. The main processed exports are wine and juice. In addition, South Africa is a major exporter of fresh citrus, and (on a smaller scale) of other fruit and vegetables. A critical role for **the dti** is to promote these exports by upgrading trade facilitation and agreements and by assisting with international marketing.

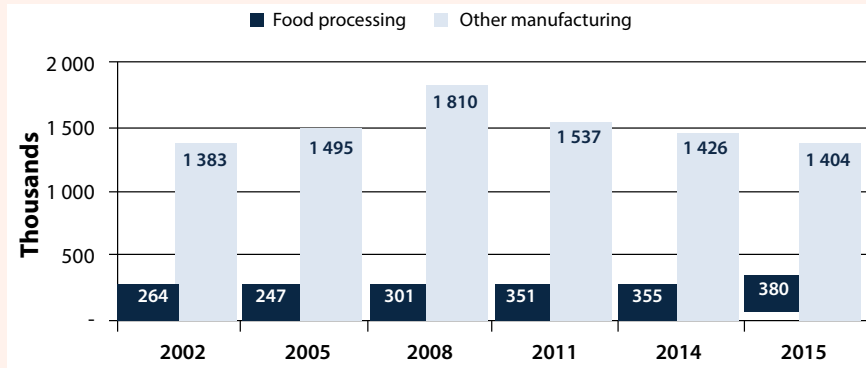
- Agro-processing also accounts for key staple foods in the local and regional markets, including maize meal, flour, bakery and dairy products, sugar products and beverages, processed and frozen fruit and vegetables, red meat and poultry. The main imported processed staple is cooking oil, although a range of other relative luxuries, such as chocolates and specialised canned goods, are also imported. In addition, some inputs for staples are largely imported, notably wheat and soy for chicken feed, as well as frozen chicken.
- Finally, agro-processing provides some intermediate industrial inputs. The largest are soy, which is used for animal feed, and sugar, although some cotton and biofuels inputs are also produced.

Figure 1. Sales of processed food industries as share of total manufacturing sales



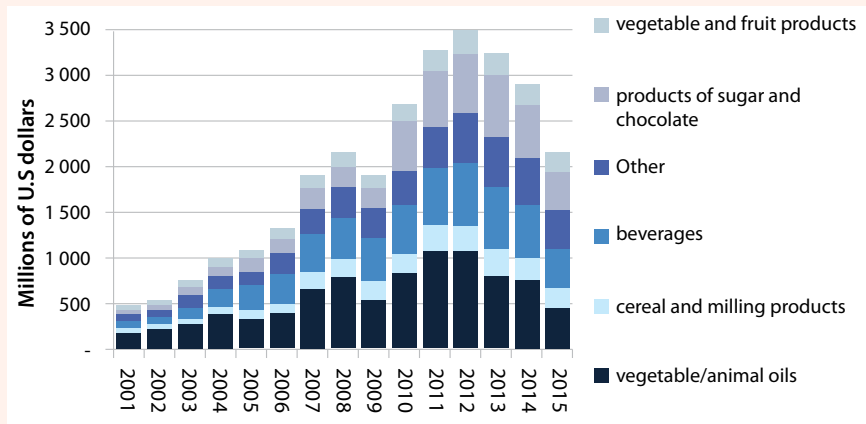
Source: Statistics South Africa

Figure 2. Employment in agro processing



Source: Quarterly Labour Force Survey

Figure 3. Major imports of processed foods



Source: TradeMap

Agro-processing positives and opportunities

- South Africa’s highly competitive exports of wine, juice and horticultural products improve the balance of payments and provide employment.
- The production of staple foods has the potential for large-scale employment and small producers, since most phases in these value chains are relatively labour intensive. Food processing, retail and food services fall directly under IPAP. If these activities grow, and especially if they can increase procurement from smaller producers, they can promote job creation and more equitable growth.
- Agro-processing can also play an important role in boosting regional integration and economic development. South Africa’s neighbours have considerable agricultural and agro-processing potential for both staples and international exports. The challenge is to ensure that trade promotes, rather than displaces, regional production.
- Staple foods are a critical factor in driving labour costs and ensuring household food security. Improving productivity and preventing rent-seeking along these value chains therefore has the potential to promote employment across the economy, whilst also improving the quality of life for working households.
- Finally, agro-processing compensates for the slowdown in the international commodity cycle in mining resources. It continued to grow even as the rest of manufacturing suffered during the 2008/9 global financial crisis and after the end of the commodity boom in 2011.

Constraints

A key constraint on agro-processing is the high degree of concentration at virtually all stages of the value chain, as the following table indicates. Compared to most upper-middle-income economies, small business has a relatively low share in employment and production in agriculture, processing, retail and food services.

Table 1. Market structure for major food products

Sector	Commercial farmers	Dominant processing companies
Maize and bread	9,000 in maize Under 4,000 in wheat	17 silo companies, based on former co-ops, control over 90% of storage; Senwes, Afagri and NWK control 75% Premier, Tiger Brands, Pioneer and Pride account for 75% of maize milling, with around 300 smaller millers also functioning Pioneer, Tiger Brands, Premier and Foodcorp control virtually all wheat milling; Pioneer, Tiger Brands and Premier account for over 85% of bread sales. Estimates suggest over 50,000 smaller formal and informal bakers, including pizza and similar franchises.
Dairy	There were 1,728 formal milk producers in August 2015, down from 3,665 in January 2008 and over 7,000 in 1997	Market shares: Clover 26%, Parmalat 18%, Unilever 7%, Danone 6%, and Cape Oil and Margarine 6%.
Poultry	Poultry is grown largely by direct subsidiaries of the large companies as well as by farmers contracted to them	Vertically integrated companies, which also produce feed, dominate poultry production, with Astral and Rainbow together controlling around half of total production. Around 400 farmers are considered “emerging” poultry farmers.
Processed fruit and vegetables	Around 8,000 farmers grew fruit and vegetables, but only about a third sold for processing	There are around 55 processors but dominant companies are Tiger Brands followed by Rhodes (which took over Del Monte in SA in 2010) – market share varies by product
Confectionery	Sugar company estates produce 7%; 1,500 commercial farmers produce 85%; 25,000 small out-growers	Mondelez, Nestle, Tiger Brands accounted for 68% in 2015; the rest largely imported

In large part, the high degree of concentration in the agro-processing value chain was shaped by apartheid laws that displaced African small farmers and enterprise and fostered centralised, large-scale processing and retail of agricultural producers. After the transition to democracy, this situation was maintained by the following factors:

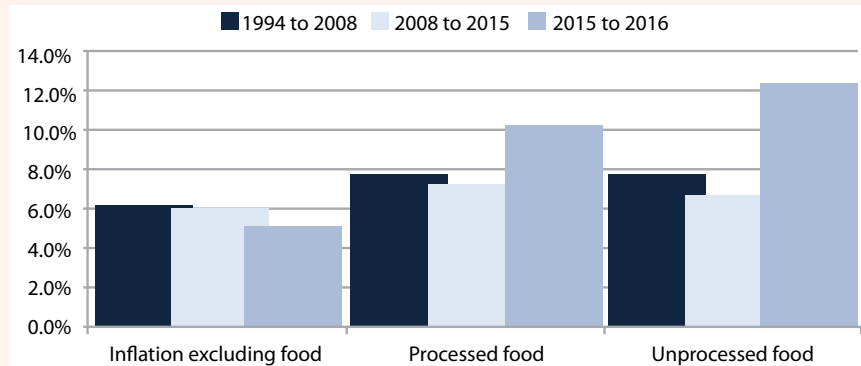
- Ownership of assets - including land but also productive capital - remained highly inequitable, as did access to infrastructure – electricity, water and logistics – and education. In this context, historically black communities – both townships and the former rural labour reserves - remained largely impoverished, lacking both industrial and retail sites and infrastructure. These circumstances limited the emergence of township and rural enterprise along the agro-processing value chain, including small-scale processing, retail and food service.
- The dominant market institutions were designed to serve relatively large producers. For instance, supermarket chains and large-scale processing plants could not easily procure from small producers, even if they existed; extension and research services were largely geared to commercial farmers; financial institutions did not have outlets in many rural areas and regarded lending to small enterprises prohibitively risky and costly.
- Overcoming these barriers requires consistent state action, both to pressure big business to take on the costs of setting up new relationships with smallholders and to provide services to new producers where the private sector could or would not.
- The structure of demand has also tended to promote concentration. On the one hand, South Africa’s unusually high degree of inequality in household incomes still affects demand in ways that tend to promote high levels of concentration. The richest 10% of households account for over half of all household consumption by value. That skews demand toward relatively luxuries that require high-end, often large-scale production.
- On the other hand, producing both processed goods and fresh fruit and vegetables for overseas markets generally requires competitive technologies for both production and logistics; large enough scale to meet the needs of international value chains; and strong quality controls. Some of these needs can be met through out-grower schemes with strong marketing institutions, but generally large producers and trading companies dominate these sectors internationally.

¹⁹ Data for basic iron and steel and basic non-ferrous metals was abstracted from SIC 351 and 352 respectively

²⁰ Data for Metal Fabrication, capital and other transport was abstracted from the following SIC codes: Metal products excluding machinery: SIC 353-355, Machinery and equipment: SIC 356-359, Electrical machinery and apparatus: SIC 361-366, Other transport equipment: SIC 384-387

Since 1994, the effects of persistent concentration have emerged in the steady increase in food prices - especially for processed products - above overall inflation.

Figure 4. CPI excluding food compared to inflation for processed and unprocessed food inflation, 1994 to 2016



Source: Statistics South Africa

Additional constraints on agro-processing include the following.

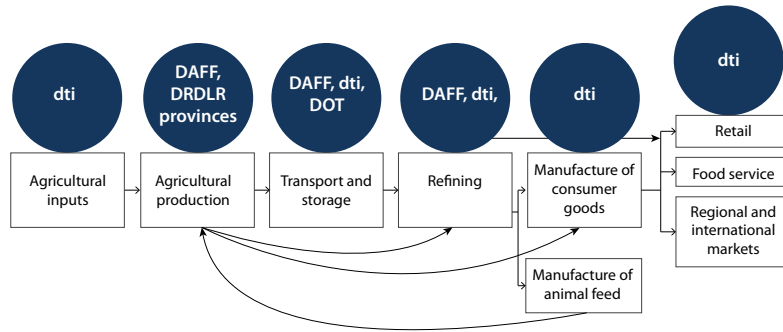
- Inadequate supply of some agricultural inputs, notably soy, which was aggravated in 2015 due to the severe drought. As a result, the cost of virtually all locally grown agricultural products saw real increases. Because most agricultural products are bulk goods, imported inputs for agro-processing tend to impose a significant price premium.
- The relatively strong currency during the commodity boom from the early 2000's through to 2011 fostered imports of processed foods and animal feed, especially from Brazil and Europe.
- Many agro-processing enterprises, especially smaller ones, are located in rural towns. The municipalities in these towns often have limited and poor quality electricity, water and waste removal. Moreover, like the rest of manufacturing, the soaring price of electricity from 2008 to 2015 placed significant burdens on producers. In addition, exporters face delays and relatively high costs, both at the ports and (often) for internal freight transport.

- Poor logistics, customs facilitation and lack of alignment around standards, including the use of GMOs, continue to pose a significant constraint on trade in agricultural and processed products in the region. This is a key challenge because much of Southern Africa has the potential to export agricultural products to South Africa if logistics could be made more reliable and affordable.
- South Africa has cutting-edge technologies in some areas, notably around wine production, the cold chain for citrus exports, and juice packing. But township and deep rural enterprises in agriculture, processing, retail and food services often do not have access to appropriate equipment and knowledge, and many do not even have adequate electricity and water.

Government's capacity to respond to these constraints in a coherent fashion has been challenged by the fragmentation of responsibility across the value chain. Different departments and spheres of the state share responsibilities for supporting agriculture, processing, retail and food services, as the following figure shows. In these circumstances, difficulties arise around the following:

- Promoting growth in agricultural supply to serve new capacity in processing, including through support for emerging small farmers;
- Securing efficient trade regulation, from phytosanitary requirements and certification to tariffs and bilateral agreements; and
- Ensuring a common government strategy and measures to encourage procurement from small producers by large retailers, processors and, where relevant, state departments.

Figure 5. Responsibilities for phases in the agro-processing value chain



Given fragmented state responsibilities, addressing the core constraints on agro-processing requires greater role clarity linked to agreement on the desired outcomes and priority programmes as well as appropriate forums to manage implementation. The Agricultural Phakisa was an important step toward achieving these aims, but its outcomes need to be institutionalised through an effective system of consultation and coordination.

There are three core directions of support for agro processing:

First: the major export industries will be supported through measures to improve the quality and affordability of value-adding services linked to logistics and financing, as well as trade measures, including phytosanitary certification. In addition, the dti will develop a dedicated strategy for promoting South African agricultural and processed goods regionally and internationally, which will include identification of strategic markets and products, including niche products, that can sustain and accelerate export growth.

Second: the production of major food products will aim to support inclusive growth through the following interventions:

- Support for small producers in processing, retail and food service, including by improving access to market information, appropriate technologies and inputs; assistance with marketing and quality control (in part by improving relations with large-scale retailers and processors); and assisting with access to finance. These programmes will build on the elements of broad-based BEE that relate to support for suppliers.
- Support for new investment in agro-processing will where possible link to programmes to support new smallholders in agriculture, including the proposed agri-parks. It is critical that new initiatives build market institutions that can effectively enable smallholders to supply into formal value chains, as well as ensuring they have adequate access to land, water and extension services. These institutions can take the form of co-ops, marketing agencies and out-grower schemes.

Third: development of a regional agro-processing chain is central to regional integration and development. Key issues include improving freight transport and customs facilitation, as well as providing industrial finance and agreeing on the location of key clusters so as to avoid regional overproduction and increase intra-regional trade.

Successful achievement of these objectives will be measured by the degree of clarity and consensus established about the roles of **the dti**, DAFF and the DRDLR - as well as the provinces and municipalities - in supporting the value chain. In this context, **the dti** will work with the other departments to streamline and improve the responsiveness of forums to consult with stakeholders in agro-processing - especially with business and labour. The Poultry Task Team provides an example of how these kinds of forum can contribute to more effective and balanced sector support.

Sector economic data

Variables	Variables
Agro-processing value add (% of GDP in manufacturing)	R77.8bn (21%)*
Agro-processing employment (% of Manufacturing)	266 401 (19.4%)
Trade balance	R12 bn

* Shows the 2014 figures

Key Action Programmes

1. Development of the Agro-processing Framework: a value chain approach

Nature and purpose of the intervention

Development of a common strategic framework for state agencies and stakeholders in the agro-processing value chain, to improve alignment around core priorities. Of importance will be strengthening the horizontal co-ordination across national departments and role-players, as well as vertical alignment between national, provincial and local stakeholders. This will build on the outputs of the Agricultural Phakisa developed towards the end of 2016.

Targeted outcome

To ensure a coherent approach to agro-processing support, the framework document will:

- Identify the main cross-cutting and product-specific constraints on inclusive growth;
- Propose strategies to address the constraints;
- Indicate the roles of state agencies and stakeholders in implementing them;
- Point to areas where collaboration will be critical for success; and
- Establish structures to promote collaboration between relevant state agencies and to unblock obstacles as they arise, actively encouraging more effective and responsive engagement with stakeholders.

Key milestones

2017/18 Q2: Draft Agro-Processing Framework developed and workshopped with relevant state agencies and stakeholders.

2017/18 Q3: Agro-Processing Framework finalised for Cabinet approval; implementation and monitoring commence.

Lead departments/agencies: the dti, DAFF

Supporting departments/agencies: EDD, IDC, DRDLR, TIPS

2. Value Chain Programme to Unlock Critical Constraints

Nature and purpose of the intervention

Work with state agencies and stakeholders to identify and address constraints on major value chains in agro processing. A key focus will be on the poultry/soy, maize milling, and dairy sectors.

Targeted outcomes

To take forward the value-chain alignment work undertaken by the Value Chain Round Tables and by Operation Phakisa, particularly in the following areas:

- Increased domestic poultry competitiveness without higher prices to consumers.
 - o Develop a sustainable cost-plus model for sales of domestic soy and maize for poultry feed and milling that maintains an incentive for increased production in South Africa and Zambia, but that is lower than the current imported price.
 - o Support the recapitalisation of poultry farms where appropriate.
- Support small-scale millers in maize to become more competitive and profitable.
- Achieve a more sustainable and growing dairy sector. Develop models for small dairy producers to become bottlers and distributors, including improving access to appropriate cold chain technologies and retail outlets.

Key milestones

2017/18 Q2: Identify critical interventions in each of the 3 identified value chains

2017/18 Q4: Resolve at least one critical constraint in each of the value-chains.

Lead departments/agencies: the dti

Supporting departments/agencies: DAFF, EDD, IDC, TIPS, CCRED, Competition Commission, provincial agricultural departments

3. Commercialisation of high-value niche sectors

Nature and purpose of the intervention

To support high-growth niche subsectors, especially those with export potential.

Key opportunities

South Africa has considerable potential for a variety of specialised horticultural products, both native to the environment and new. The core challenge has been to ensure effective and responsive state support for innovative and emerging producers who are not served by existing markets and regulations. Key issues include: market information on new products with high potential for growth; technological and marketing support; initial finance; meeting phytosanitary requirements; and reforms to regulations where required for new products.



Targeted outcomes

Establishment of a suite of measures to support niche sub-sectors, including: assistance with market information and marketing; propagation of new technologies; unblocking unnecessary regulatory and infrastructural barriers and delays; and initial industrial and trade finance. The measures should where possible promote sub-sectors using good clustering methodologies and practice, but may also focus on individual innovative projects where appropriate.

Key milestones

2017/18 - Q2 Publication of a suite of measures to support niche producers linked to the new agri-incentive programme.

2017/8 - Q4 Roll out of support measures, providing effective assistance to 3 niche sub-sectors or cluster initiatives.

Lead departments/agencies: the dti

Supporting departments/agencies: IDC, DAFF, TIA, DST, CSIR, ARC, EDD, DSBD, Provinces, industry associations.

4. Agro-processing Supplier Development Programme (Agri-SDP)

Nature and purpose of the intervention

To build proactive partnerships between government, the private sector and donors to ramp up procurement by large retailers and agri-producers from emerging and marginalised producers and farmers, as well as medium-sized players. To move beyond standard Corporate Social Initiatives (CSI) supplier development programmes and to mainstream the support for marginalised players into the formal supply chains. This will entail substantial investment by both the public and private sector into upgrading programmes in partnership with and guided by the retailers and large producers.

It should go alongside a consistent programme of state support for small producers, including unblocking regulatory and infrastructure obstacles, links to land reform and access to water, incubators and extension services as well as assistance in marketing.

Interventions should include:

- Maximising the effectiveness of the proposed new agri-parks, in particular by ensuring they are embedded in appropriate market institutions that serve small farmers and processors.
- Engaging on a Procurement Charter with large retail chains and processors to scale up their supplier development programmes, to facilitate sales by small farmers and processors and to support alternative outlets and food service facilities.
- Working with the retailers to identify potential exporters, and to package support around these companies in terms of upgrading support and other available government assistance.
- Identifying suitable beneficiaries for the Black Industrialists Programme.

Targeted outcome

A significant up-scaling of support by the major retailers and large agri-processors. This should see a doubling of procurement from emerging producers and farmers within a three-year period. It will require the crowding-in of finance towards the upgrading of emerging producers in terms of support such as improved phytosanitary standards, productivity, lean manufacturing methods, investment in capital equipment, IT systems and marketing. At least 500 emerging suppliers should have undergone upgrading or been otherwise supported by the end of a three-year period.

Key milestones

- 2017/18 Q1: Open up relationships with 3 of the mainstream retailers and 3 large agri-producers to assess their current levels of support for emerging players, and address the challenges of bringing them effectively into the supply chains.
- 2017/18 Q2: Develop a position paper for the state and private sector around a Procurement Charter.
- 2017/18 Q3: Agreement on a Charter or Code of Conduct with leading retail chains and food processing conglomerates, including (a) commitments from large companies that set targets for procurement from small producers, with large-scale supplier-development schemes and easier access to sales outlets; (b) reciprocal commitments regarding state incentives to leading firms and support for small producers; and (c) the establishment of a task-team to monitor progress and unblock bottlenecks as they manifest themselves.
- 2017/18 Q4: Implementation of the Charter and state supplier-development measures and programmes.

Lead departments/agencies: the dti, DAFF

Supporting departments/agencies: EDD, TIA, IPA's, the CSIR

5. Agro processing export strategy

Nature and purpose of the intervention

To ensure strategic support for high-value agricultural and processed exports.

Key opportunities

As noted earlier, South Africa has seen rapid growth in horticultural and processed exports, mostly juice and wine. Opportunities exist to expand exports to the Middle East and Asia as well as to sustain growth in exports to the global North. Critical constraints include:

- a) Establishing capacity to identify opportunities in new markets and to promote South African products in these markets on a larger scale, and
- b) Ensuring that phytosanitary and trade agreements consistently facilitate agriculture-based exports.

The agro-processing export strategy should lay the basis for addressing these constraints by the following means:

1. Developing costed measures for increasing exports to the Middle East and China, including priority products, specific marketing channels and modalities, phytosanitary and trade-policy requirements.
2. Engaging key partners in the public and private sector.
3. Identifying infrastructural and logistics requirements for expanding exports.

Targeted outcomes

Continued growth in horticultural and processed exports despite global economic fragility.

Key milestones

- 2017/18 Q2: 3 initiatives developed and costed for increasing exports to the Middle East and China, and partnerships developed with relevant companies and state agencies.
- 2017/18 Q4: At least 2 measures implemented.

Lead departments/agencies: the dti

Supporting departments/agencies: EDD, IDC

CASE STUDY: FABCOS/HOME GROWN INVESTMENT HOLDINGS (PTY) LTD MICRO MAIZE MILLS

In April 2013, the dti and the Foundation for African Business and Consumer Services (FABCOS) signed an MoU identifying strategic investment projects that would have a major impact on the transformation of the economy. FABCOS is a multi-sectorial national member-based business chamber that serves the interest of small black-owned businesses located in the townships and rural areas of South Africa. Its mission is to build an alternative food value chain within the agriculture and agro-processing sectors.

Under the MOU at least R1.74 bn worth of investment funding is set to be injected into the South African economy, with R526 million coming from **the dti** in permutations of grants and incentives. Thus far, **the dti** has disbursed R160 million of the earmarked amount.

The projected total number of new jobs expected over the next three years is 7,007 - of which 697 will be direct and 6,310 indirect. To date 255 effective jobs have been created. The average cost per targeted job (based on the total investment value of the projects (R 1.73 bn) is R1,001.

The star performer to date, in both domestic and SADC markets, has been the Home-Grown brand.

The Fabcos/Home Grown product range



CASE STUDY: ABAGOLD LIMITED: AQUACULTURE (ABALONE) INVESTMENT

Abagold Limited is a multi-million abalone farming and processing establishment based in Hermanus in the Western Cape. It currently employs 1,200 people, most of whom are from historically disadvantaged communities.

Abagold is on an aggressive expansion path, and to further its expansion plans it applied to **the dti** for financial assistance of R56.7 million through the Aquaculture Development Incentive scheme (ADEP). Of this, R11.9 million has so far been approved. The net sum effect of this expansion, as things stand, will be an additional 180 jobs.



ABAGOLD™

The *quid pro quo* required of Abagold by **the dti** – and under the guidance of Productivity SA - was a structured production efficiency and productivity upgrading programme.

On 25 October, 2016, Abagold won the Excellence in Exporting and Best Non-Manufacturing Company Award

5. Forestry, Timber, Paper and Pulp, and Furniture

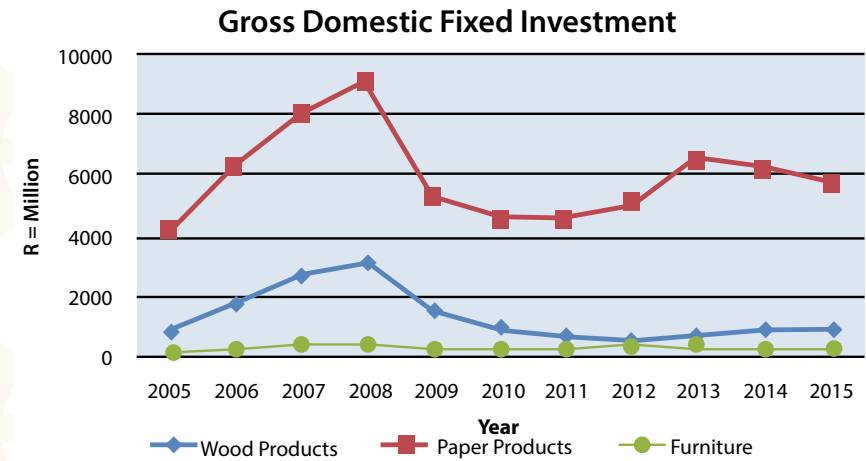
Situational Analysis

The forestry sector is a major contributor to the South African economy through its diversified forestry-based products. The sector provides the raw material for beneficiation in subsectors such as pulp and paper, sawmilling, particle boards for furniture manufacturing, mining timber, construction and poles.



According to Statistics SA the entire forestry value chain accounted for 198,000 jobs in 2015, with 133,816 in timber processing and an additional 65,000 in forestry production. The sector is one of the lead sectors identified as part of the National Industrial Policy Framework due to its potential for growth and employment, especially in rural areas. However, many parts of the sector have not received much new investment, as shown in Fig 1. Thus, sub-sectors such as furniture and timber production are characterised by ageing capital equipment, with many companies facing difficulties in accessing capital.

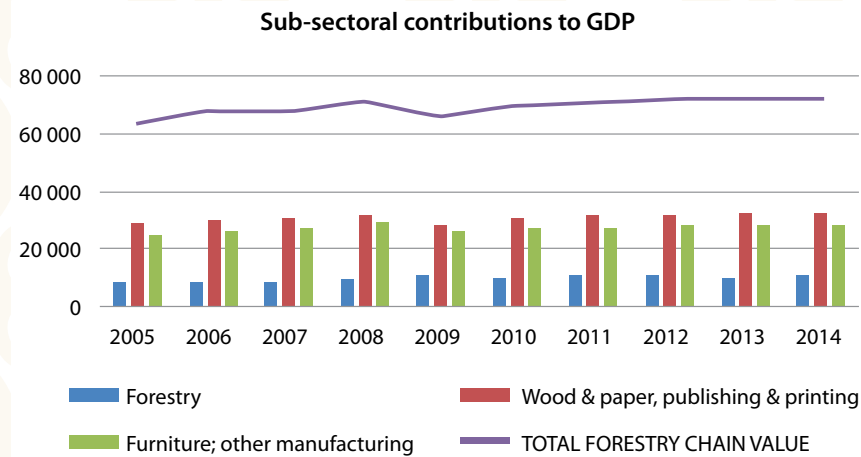
Figure 1. Wood, paper products and furniture: gross fixed investment 2005-2015



Source: Statistics South Africa

The forestry and forest products industry contributed R72.1 bn to GDP in 2014. The full timber value-chain contributes 13% to manufacturing GDP. South Africa has approximately 1.26 million ha under plantation, with the total value of timber produced in South Africa being R 11.1 bn; whilst associated value-adding sectors contributing a further R32.3 bn and sales to processing plants adding a further R28.5bn for the furniture industry.

Figure 2. Forestry Timber Pulp, Paper and Furniture Contribution to GDP²¹

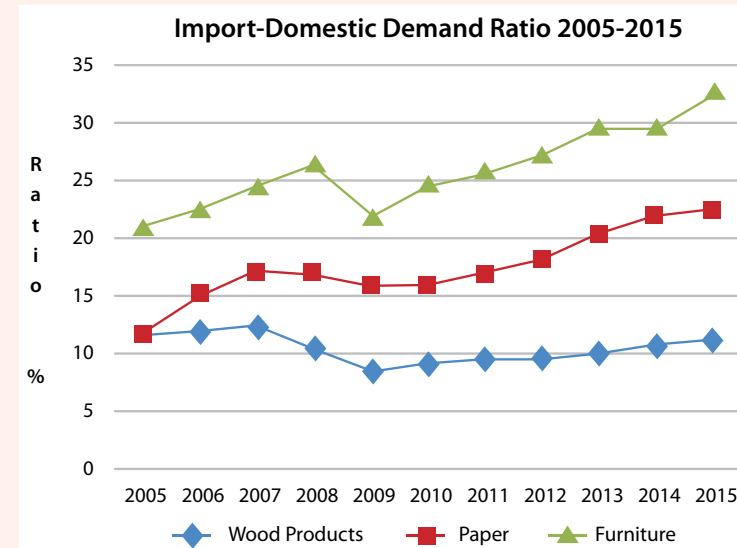


Source: Statistics South Africa

Despite its potential, the sector faces major structural challenges, particularly around access to raw material, which remains a major constraint for the entire downstream processing industry. This is reflected in the fact that demand for timber and timber products has increased steadily over the last decade, while supply has declined. Fig 3 below shows that import penetration is generally increasing. As an example, printing paper has increased from 10% to more than 21% over the 10-year period from 2005.

²¹ At 2010 constant prices

Figure 3. Timber Pulp, Paper and Furniture Import Domestic Demand Ratio 2005-2015



Source: Statistics South Africa

The Southern African region is endowed with vast forests, but currently a lot of this timber is exported with very little beneficiation. A key initiative is thus the creation of regional value chains that move products between countries in the region.

Sawmilling sector

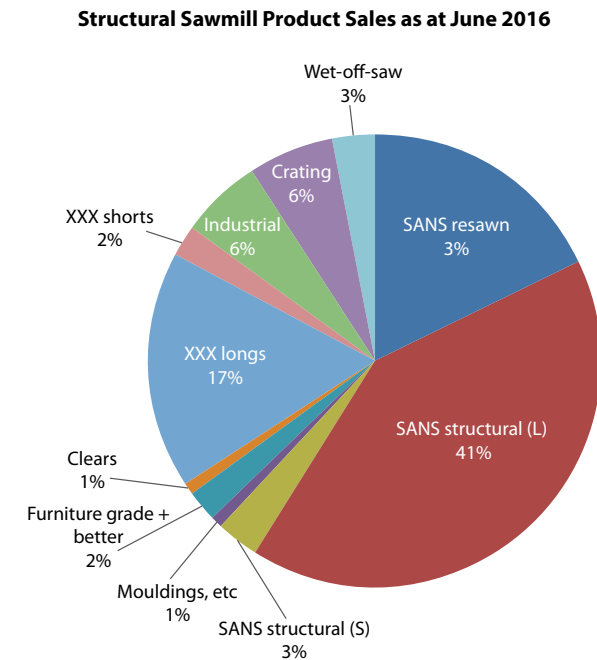
Situational analysis

The sawmilling industry is the second largest employer (direct and indirect) in the forestry sector, and is made up of mostly unskilled and semi-skilled workers. The industry currently employs around 18,000 people directly and 10,000 indirectly. The sub-sector has relatively low levels of concentration, with smaller independent informal and formal saw millers holding around 50% of the market.

Sawmilling Sector Constraints

- **Shortage of raw materials:** Given the vertical integration of the industry, large companies obtain their raw material for their processing activities from their own plantations. Small and medium enterprises in the sawmilling (and furniture) sector, without their own plantations, are the worst affected by the scarcity of supply, and compete for timber from DAFF, SAFCOL or private companies in the form of short contracts.
- **Low recovery rates:** The sawmilling industry is also characterised by a high number of smaller companies using out-dated and inefficient processing equipment. This results in low recovery rates – averaging less than 50%. Considering that the cost of logs makes up to 50% of the total cost to sawmills, this is an important constraint. Improving the recovery rates of sawmills will contribute significantly to improving the competitiveness of the sector.
- **High cost base:** Costs associated with transport, technology and energy are currently inhibiting the profitability of the industry.
- **Low levels of management skills in emerging enterprises:** Emerging sawmillers require training and mentorship to grow their businesses.

Figure 4. Structural Sawmill Product Sales as at April 2016



Source: Sawmilling South Africa

Sawmilling Sector Opportunities

- **Cluster Development:** Small-scale sawmills have the opportunity of organising themselves into cooperatives/clusters to increase the scale of their orders to log suppliers.
- **New Market Development:** There is a potential in diversifying markets and opening new products markets especially for the emerging sawmillers. This can be achieved through drying and treating of wood, producing products such as building trusses, graded and packaged wood, pallets, desks and furniture.
- **Bio Refinery:** Untapped opportunities exist in the processing of waste to produce energy, bio-digesters, charcoal and other bio products.

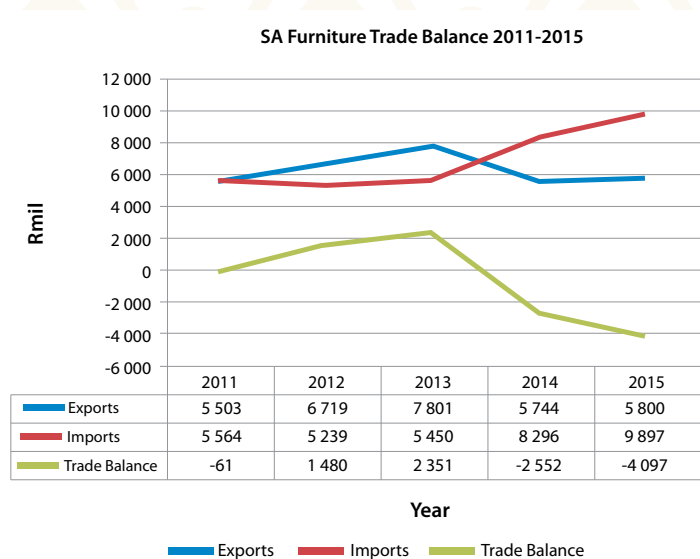
Furniture Manufacturing

Situational analysis

The furniture Industry is an important sector of the South African economy, as it is comparatively labour-intensive, has potential to contribute to increased exports and offers opportunities for the developments of small, medium and micro enterprises (SMMEs).

It may also contribute to the geographic spread of economic activity since products can be produced in rural areas with relatively low initial investment requirements. Currently the industry employs approximately 28,200²² people, and there are about 2,200 registered firms involved in furniture manufacturing. The furniture industry contributes about 1% to manufacturing GDP and 1.1% to manufacturing employment.

Figure 5. South Africa Trade Balance as at December 2015



Source: Trade Map

²² IDC Sectoral Trends 1st Quarter 2016

²³ South Africa Quarterly Trade Statistics Q2 2016

²⁴ IDC Sector trends: Performance of the 10and 20 sectors of the South African economy Q1 2016: July 2016

South Africa's exports of furniture were worth R4.748 bn in 2016 (cumulative from July 2015 to June 2016²³) and imports were worth R8.2 bn during the same period. Five out of the top seven South African export destination markets for furniture are other African countries namely Namibia, Botswana, Swaziland, Lesotho, Zambia, and Mozambique. The top exporting products remains beds and mattresses, furniture components, and chairs²⁴.

Table 1. Furniture Sector Constraints and Opportunities

Furniture Sector constraints	Sector Opportunities
<p>Declining competitiveness</p> <ul style="list-style-type: none"> • Cost of speciality wood inputs. • Tooling, utility and related input costs are very high. • Technological innovation lagging - low levels of efficiency. • Minimal research and development • Shortage of skills: specifically, furniture designers, wood machinists, upholstery and machine operators. • Stiff competition from cheap imports. 	<p>Improved Competitiveness</p> <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 saw millers.
<p>Access to the furniture retail market</p> <ul style="list-style-type: none"> • Significant retailer power erodes margins and creates barriers to market access - four big retail players have 80% market share. • Public sector procurement has been disappointingly low, despite regulations. Procurement officers are applying for and receiving exemptions that should not be permitted. 	<p>Market Development</p> <ul style="list-style-type: none"> • Low income market development – durable products mass production for this market • High income market development – unique high quality niche market. • Export Market – grow the regional markets and maintain global markets. School and office furniture market. • Increase adherence to preferential procurement of furniture.
<p>Access to Finance</p> <ul style="list-style-type: none"> • Industry is highly fragmented with small to medium owner-managed firms, largely unable to apply for development funding. 	<p>Improve Access to Funding</p> <ul style="list-style-type: none"> • Creation of a recapitalisation fund. • Cluster development. • Private sector assistance.
<p>Volatility & Seasonality of the industry</p> <ul style="list-style-type: none"> • Company strategies fail to respond to dynamic changes in the market. 	<p>Market development Intra Sector Cluster Development.</p>
	<p>Regulatory</p> <ul style="list-style-type: none"> • Enforce the designation of furniture in terms of the preferential procurement regulations. • The Consumer Protection Act-promote awareness of high quality products.

Pulp and Paper Manufacturing

Situational analysis

The South African pulp and paper manufacturing sector is a robust, well-regulated and highly developed industry, which makes a significant contribution to the local economy. In 2015, the value of the pulp and paper production sector amounted to R28 bn, with R5 bn being the direct contribution to the balance of trade.

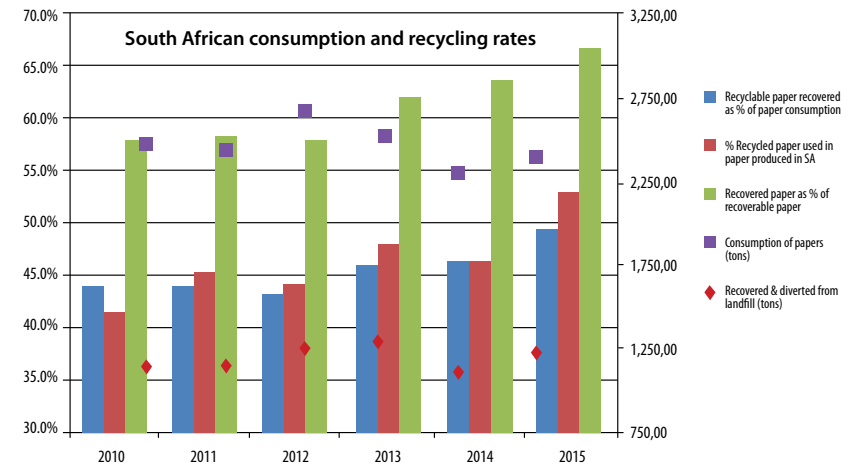
According to the latest figures released by the Paper Manufacturers' Association of South Africa (PAMSA), there was a slight increase in total paper production from 2,261,000 to 2,289,000 metric tonnes in 2015. Packaging, tissue and chemical cellulose are growth sectors for South Africa. They are showing the work, energy and ability to refocus of an industry that was under pressure but which is now emerging with increased global competitiveness in its chosen grades.

Production of packaging grades increased by 7% between 2014 and 2015, demonstrating that the local paper packaging industry, despite plastic substitution challenges, is showing sustained growth nationally and internationally in terms of exports.

Printing and writing grades, on the other hand, continue to show a gradual decline in production as a result of the move towards electronic media, industry cost pressures, consumer difficulties and increasing global competitiveness. Local production levels continue to suffer as a result of higher imports. Consumption increased for the first year in 2015 due to increased demand for printed paper books as the e-book market plateaus.

Tissue grades are the only grades that are directly linked to the Fast-Moving Consumer Goods (FMCG) market, and as a result any pressure economically will show up in tissue papers. Despite this, there has been growth, largely due to increased population and potential access to the market in Africa. An additional 100,000 tonnes of new capacity are expected to come online at four different companies during the next 18 months. Some of the tissue wadding will be sold on to small tissue converters, whilst others will be high quality two-ply that will be converted in-house.

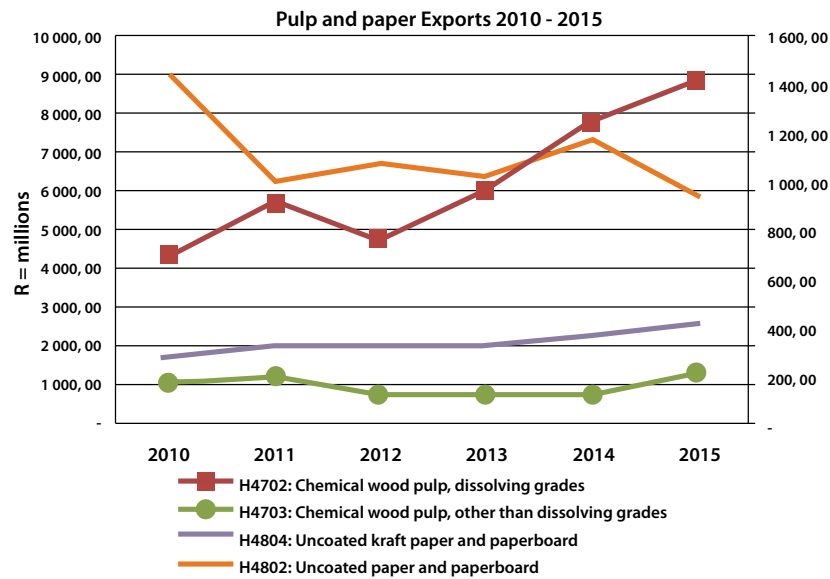
Figure 6. Paper industry Production 2010 to 2015



Source: PAMSA

Pulp production is currently static in South Africa. However, the export value is up just over 6%, reflecting the influence of a depreciating exchange rate.

Figure 7. Pulp and Paper Industry Exports 2010 to 2015



Source: PAMSA

Table 2. Constraints and Opportunities in the Pulp and Paper Industry

Pulp and paper Sector constraints	Sector Opportunities
<p>Raw material supply</p> <ul style="list-style-type: none"> Demand for virgin fibre is increasingly high and rate of afforestation is slow. An increase in demand for recycled fibre and increased exports has led to a shortage locally. 	<p>Improve Raw Material</p> <ul style="list-style-type: none"> Re afforestation and new afforestation. Investing in the recycling industry to increase the recovery of recyclable paper to meet local demand. Address concerns around increasing exports of recycled fibre. Regional integration.
<p>Skills shortage</p> <ul style="list-style-type: none"> Shortage of artisans, chemical engineers and highly skilled manpower. 	<p>Skills development</p> <ul style="list-style-type: none"> Increased enrolment of chemical engineers and technicians. Artisan training and apprenticeship.
<p>Underdeveloped Infrastructure</p> <ul style="list-style-type: none"> High transport costs due to use of road instead of rail. 	<p>Infrastructure development</p> <ul style="list-style-type: none"> Investment in rail network closer to the plantations.
<ul style="list-style-type: none"> Misperception of the industry's environmental impact. Digitisation leading to a decline in printed publications. 	<p>New Market Development</p> <ul style="list-style-type: none"> The development of sustainable and renewable energy technologies. Opportunities offered by co-generation in the pulp and paper industry. New product development for nano cellulose applications and green chemicals.
<ul style="list-style-type: none"> Cheap imports of paper continue to hamper competitiveness of locally produced products. 	<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.

CASE STUDY:

Investment in new technology – chemical industry: KAP/ Woodchem

Woodchem produces various urea formaldehyde (UF) resins for the panel industry, and is the largest producer of wood panel resins in Africa. It also supplies formaldehyde into more than 30 different industries in South Africa.

On the back of a R30 million dti grant under the Manufacturing Competitiveness Enhancement Programme (MCEP), KAP invested R117 million into Woodchem SA's production facility in Piet Retief. This facility is the largest in sub-Saharan Africa, producing 100,677 tonnes of UF resin annually. The investment contributed to increased capacity of the existing UFC plant and the establishment of a new paper impregnation line. The new paper impregnation line – which includes heat recovery systems reducing energy usage by 35% - is the only one of its kind in sub-Saharan Africa.



TOTAL INVESTMENT: R117mil; COMPLETION DATE: production started in 2016. PRODUCTION CAPACITY per annum: +/- 80m m2 paper; 120,000 tons formaldehyde and resin; EMPLOYEES at the facility: 76; EMPLOYEES at new impregnation plant: 30; EMPLOYEES in the division: 214

The PG Bison group previously imported impregnated paper from European countries for upgrading. The paper impregnation line has substantially decreased imported volumes, directly benefitting local manufacturing.

CASE STUDY:

Restonic/KAP – 12i Tax Incentive supports major new plant

Restonic is a manufacturer of mattresses and base sets under the brands Restonic, Genessi, Sleepmasters, Dunlopillo, Cozy Nights and Vita Rest.

A family business launched in 1981, Restonic was incorporated into the manufacturing division of KAP Industrial in January 2015.

KAP's bedding division has invested more than R300 million in a new "super plant" located at Restonic's headquarters in Johannesburg and due to open in June 2017.

KAP received approval on phase 2 for a 12I tax allowance for R53.5m



TOTAL INVESTMENT: R300mil; COMPLETION DATE: June 2017; ESTIMATED PRODUCTION per annum: +/- 280,000 mattress and base sets; EMPLOYEES at the facility: +/-550; EMPLOYEES within the division: 1 497

This plant is a first-of-its-kind in Africa and the largest automated mattress assembly facility in the Southern Hemisphere. It is also SA's first fully vertically integrated mattress and bed base factory. It will enhance efficiencies and increase the division's capacities and economies of scales.

Environmentally sensitive use of power, air and water will be optimised. Restonic's implementation of a zero waste policy will feature rain and grey water harvesting, recycling of off-cut products back into the finished product and possible solar power installations.

Key Action Programmes

1. Furniture Competitiveness Programme

Nature and purpose of the intervention:

This is the continuation of an existing IPAP programme aimed at improving competitiveness in the furniture manufacturing sector through the organisation of manufacturers and suppliers located in the same geographical areas and the use of previously trained furniture manufacturers not currently in operation (e.g. former Furntech incubates).

There are several trained furniture manufacturers, SMMEs and informal manufacturers who are currently not actively participating in the industry. The project aims to develop a comprehensive package of support services for these manufacturers, including proper advisory services and financing. This generally involves bringing together and coordinating existing support available from government departments and other organisations. The trick here will be to package these services and ensure that they are properly communicated to the potential beneficiaries.



Trained individuals and businesses developed from the incubation process can play a vital role in improving industry competitiveness and growing the economy. Like most SMMEs, these companies have challenges related to their size: mainly the ability to access markets and reduce input costs. This calls for much more structured collaboration in the furniture industry, especially in support of the small and newly-established manufacturers. Several industries have successfully organised their players in manufacturing hubs, clusters or industrial parks. The current situation with incubates presents an opportunity to further support and organise trained manufactures, and thus improve productivity and competitiveness.

The study is now at an advanced stage and has identified preferred models of organising these manufacturers. The feasibility report is now costing the preferred model and looking at areas suitable for pilot project implementation.

Targeted Outcomes:

Organised competitive furniture manufacturers leading to improved productivity and manufacturing value added; increase employment in the sector by 2% annually.

Key milestones

2017/18 Q2: Securing funding for the implementation of the pilot project.

2017/18 Q3: Secure partners (municipalities) for implementation.

2017/18 Q4: Continuously strengthening working relations with the furniture association in improving competitiveness.

Lead departments/agencies: the dti, SAFI

Supporting departments/agencies: SAFI, Provincial Departments, SEDA, Fibre Processing and Manufacturing SETA, EDD

2. Furniture Market Access Development

Nature and purpose of the intervention:

- Improving access to markets for locally manufactured products, especially for regional markets such as SADC;
- Increasing local market share in the low-income furniture market, currently dominated by cheap imports;
- Cluster development in the furniture sector: companies located in the same geographical areas and the furniture incubates exiting the incubators will be targeted for the development of product-specific mass production.

Two other major challenges will have to be urgently addressed by this intervention:

1. The high concentration of the furniture retail sector – which makes it difficult to get retailers to buy locally-produced furniture. (The major retail chains, with a market share of 80% dominate the market, while the remaining 20% is shared among independent furniture retailers). This affords the major retailers – and the retail sector as a whole - huge bargaining power against manufacturers, leading to suppressed producer prices and unfavourable payment terms.

2. The failure of the designation of furniture for local procurement by the public sector to achieve a meaningful impact. It appears that many procurement officers are simply bypassing or ignoring the regulations.



Targeted Outcome 1

Increased local and regional market share.

Key milestones

- Year 1: Local market development: 2017/18
- 2017/18 Q2: Review of domestic market opportunities and regulatory frameworks.
- 2017/18 Q4: Development and Implementation of the market access programme.
- Year 2-3: Regional market development
Review of regional market opportunities and regulatory frameworks.
Facilitation of trade promotion activities directed at exporting to the SADC markets.
- Year 4-5: International market development
Review of global market opportunities and regulatory frameworks;
continued facilitation of trade promotion activities directed at exporting to the SADC markets

Lead departments/organisation: the dti, SAFI,

Supporting departments/agencies: EDD, DST, CSIR, Export Councils, CSIR, Fibre Processing and Manufacturing SETA.

Targeted Outcome 2

Enforcement of local procurement designation.

Local procurement designations must be strictly enforced, in partnership with National Treasury. The dti will work with National Treasury to ensure that furniture procurement that does not meet local procurement targets will be deemed “unauthorised expenditure”, unless written permission has been obtained in advance, from National Treasury.

Local procurement designations must be extended to premises rented by public sector entities. A medium-term strategy will be developed to ensure that, in order to qualify as a potential premise for a public-sector entity, the property in question must contain a designated minimum value of locally-procured furniture.

Key milestones

- 2017/18 Q1: Engage with Treasury to develop and publish the required regulations.
- 2017/18 Q3: Engage the local retail sector in developing targets for local procurement.
- 2017/18 Q4: Develop and publish the regulations with respect to qualifying minimum local furniture levels for approved premises for public sector entities.

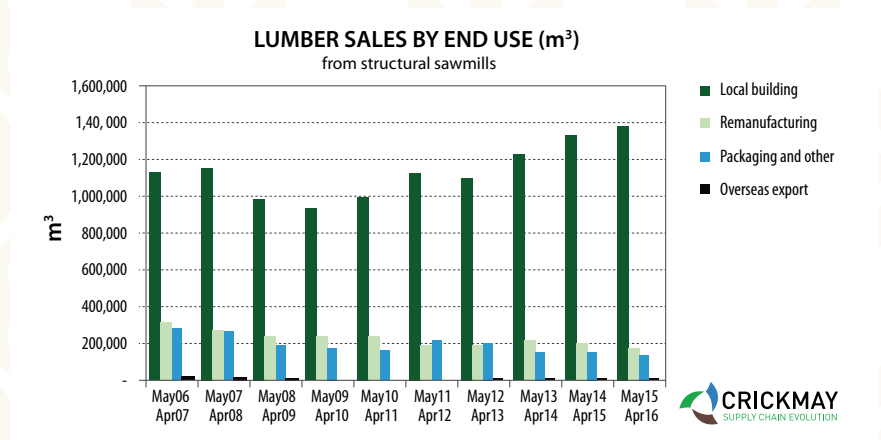
Lead Department: the dti

Supporting entity: EDD, National Treasury, DPW

3. Product Development and Market Access for Small-Scale Sawmills

Nature and Purpose intervention:

The South African sawmilling industry is dominated by the production of structural timber for construction, whilst a smaller proportion goes into remanufacturing, exports and packaging. The risk with production of a single market product - where over 81% of the total output is structural timber - is that when there is a slowdown in construction, it hits the sawmilling industry hard.



Source: Sawmilling South Africa

Targeted Outcome

- Improved value-addition, new product development, market access - and hence increased profitability - of small- and medium-scale sawmills; significant job creation.

The value addition centre will focus on resolving the challenges of access to raw materials, recapitalisation and access to new markets.

Key milestones

- 2017/18 Q2: Develop a market access and new product development programme for small scale sawmills.
- 2017/18 Q4: Implement the market access and new product development programme.
Design and Implement a low-interest capital loan fund for the sawmilling sector, in partnership with the IDC.

Lead departments/agencies: the dti, IDC

Supporting departments/agencies: EDD, Provincial Government, ECRDA, SSA, DAFF, SEDA, Fibre Processing and Manufacturing SETA, DRDLR.

4. Regional Development Programme in the Forestry Value Chain

Nature and Purpose of intervention

The dti has assisted South African companies to explore opportunities for investments in and import of tropical hard wood timber from Mozambique. This project will extend the focus to other parts of the region - beginning with Zambia and Tanzania – and will be focused on stimulating growth in the regional forestry and sawmilling sector, strengthening the supply of raw material to the industry and improving access to semi-processed materials.

Targeted Outcome

A well-developed Africa strategy for the forestry-based industries, which would also promote growth in beneficiation by countries in the region.

Key milestones

- 2017/18: Q1- Q3: Consultation and strategy development.
- 2017/18: Q4: Launch of Forestry Africa Strategy.

Lead departments/agencies: the dti

Supporting departments/agencies: EDD, DAFF, PAMSA, SSA, FSA, SAFI

5. 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. In this context, 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 programme will be piloted in the Ekurhuleni municipality, but expanded to other municipalities when the pilot has proven to be a success.

The Programme has been divided into four sub-projects: (i) Paper Recycling Analysis Report; (ii) Enterprise development; (iii) Awareness campaign; and (iv) Strategic partnerships. The **dti** will be responsible for supporting all four sub-projects and involved in the management of the sub-projects with specific focus on the development and maintenance of the 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 Programme.

It will also continue to support enterprise development, and, more specifically, the recycling industry through provision of targeted financial and non-financial assistance.

Targeted Outcome

A significant increase in the amount of paper collected for recycling, through enterprise development, awareness campaigns and strategic partnerships; meeting local demand for recycled fibre.

Key milestones

2017/18: Q2: Completion and distribution of the Paper Recycling Analysis Report and presentation of the action plans for each of the sub-projects.

2017/18: Q4: Implementation of the plans.

Lead departments/agencies: the dti, PAMSA

Supporting departments/agencies: EDD, PRASA, Ekurhuleni Municipality, SALGA

6. Plastics, pharmaceuticals, chemicals & cosmetics

6.1. Plastics sector

Situational analysis

The plastics industry is a significant contributor to the economy, with a turnover of R75 bn in 2015, representing about 1.9% of GDP and approximately 16.5% of the manufacturing sector. The plastics industry employs around 60,000 people (both formal and informal) with almost 1,800 companies across the plastics supply chain. Plastics conversion plants are generally small to medium-sized, family-owned businesses.

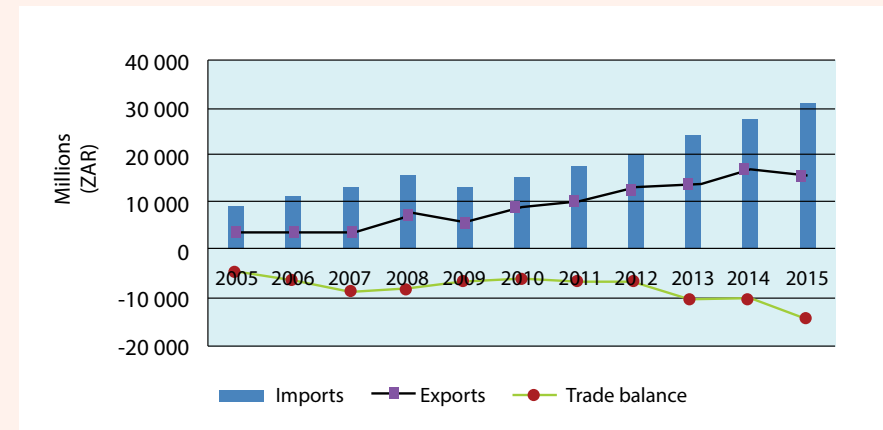
The export value of plastic products in 2015 was R15 bn, as against imports to the value R30 bn, leading to a trade deficit of R15 bn; an increase of R5 bn compared to the 2014 trade deficit.



Sector economic data

Variable	Contribution in 2015
Manufacturing value-add	R75 billion
Manufacturing employment	>60 000
Trade balance	-R15 billion

Figure 1. Trade balance



Recycling

Recycled input material in 2015 was 310,641 tonnes – a decrease of 1.6% compared to 2014. The diversion from landfill rate was 20.8% of the 310,641 tonnes of recycled material, 292 917 tonnes were mechanically recycled in South Africa. In 2015, formal employment in the plastics recycling sector increased by 3.3% to 6,234 workers year-on-year, whilst informal employment increased to 48,820 workers - bringing the total number of jobs through plastics recycling to 55,054.

Figure 2. Profile of the plastics sector

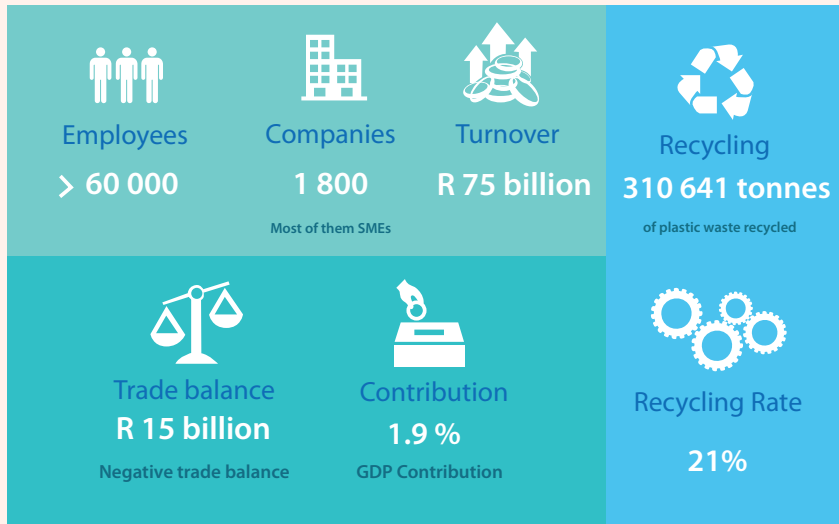


Figure 3: Major industry destinations for plastic components



Constraints

Plastics converter plants are generally small to medium-sized, with an average size of 130 employees. Many plants have fewer than 50 employees, and those with 400 or more employees are generally considered to be large. Constraints faced by the plastics sector include import parity pricing of polymers and other key inputs, as well as:

- Pricing of raw materials;
- Relative small local and regional market;
- Lack of advanced manufacturing practices;
- Lack of downstream focus in R&D effort; and
- South Africa’s geographic position and resultant logistics costs.

Progress highlights for the plastics sector

- Mpact Polymers state-of-the-art PET recycling plant in Wadeville, Germiston, was commissioned at a cost of R350 million.
- Designation of wheelie-bins.
- Invoked section 9.3 of the PPPFA on stationery procured by SOCs and municipalities.
- Establishment of NAM Cluster.
- A risk engine to combat misdeclaration and under-invoicing (customs fraud) was established. SARS has thus far recovered about R500,000 through the correction of quantity and duty for the period December 2015 to August 2016, as part of clamp-down on misdeclaration.



Mpact Polymers, Wadeville

Key Action Programmes

1. Designation and localisation

Nature and purpose of the intervention

Government has committed to achieving 75% local content across public procurement. This strategic intent can only be realised through leveraging current and future state procurement as part of new or upgrading of infrastructure. This has a potential to spur industrialisation by increasing market size, fostering economies of scale and, more importantly, reducing the trade deficit in the sector.

In view of this, the dti has prioritised to continue working with key departments and procuring entities to identify a range of products for strengthening and deepening localisation and local supplier development.

Some of the products identified to benefit from this procurement programme were plastic pipes that are used for water supply and sewage disposal and refuse bags used in household waste removal. Large quantities of these commodities are being procured by key government departments and where the local industry has capabilities, this procurement can be leveraged to resuscitate the local plastic pipes and refuse manufacturing industry and create employment in the associated supply chains. These industries also comprise of small to medium enterprises to which designation will also contribute to government's objective of promoting SMMEs.

Targeted outcomes

Optimised localisation opportunities presented by the 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.

Key milestones

2017/18 Q1 – Q4: Develop concept document, conduct research, consult with relevant stakeholders and populate the standard designation template on refuse bags and plastic pipes.

Promote localisation of plastics products procured by State entities through invoking Section 9.3 of the PPPFA.

Submission of the designation proposal to IPU and Exco.

2. Plastics Components Cluster

Nature and purpose of the intervention

Presently, cluster-based economic development is at the forefront of promoting innovation, productivity growth, development and competitiveness through collaboration and cooperation between industry and other key stakeholders. Clustering enables companies to operate at higher levels of efficiency, drawing on shared infrastructure, more specialised assets and suppliers with shorter reaction times than they could in isolation. It also enables companies and research institutions to achieve higher levels of innovation.

Knowledge spill-overs and close interaction with customers and other companies create more new ideas and provide intense pressure to innovate, while the cluster environment lowers the cost of experimenting.

It is, therefore, envisaged that through the development of an effective and efficient cluster system - and with increased investment - the Plastics Industry will be better positioned to diversify from basic to more sophisticated value added products with the potential to drive significant growth and employment creation across the sector as a whole.

The main aims of the cluster will be as follows:

- Deal with challenges facing plastics manufacturing such as input costs, skills development and technology innovation, etc.;
- Identify opportunities for growth and exports;

- Identify gaps and ways to integrate and strengthen the link between the plastic industry and other cross-cutting industries – plastics products typically serving as key intermediary inputs into the final product of other industries (e.g. the automotive industry).

Targeted outcomes

- Increased productivity and competitiveness of member companies;
- Promotion of locally produced plastic components into other key sectors such as the automotive sector;
- Identification and assistance in dealing with constraints and opportunities for accessing raw material according to the location of the cluster;
- Export promotion;
- Skills development and training;
- Research and development for innovative products and import substitution;
- Benchmarking exercises.

Key milestones

2017/18 Q1-Q2: Feasibility Analysis and Business Case for Implementing the Cluster including identifying cluster members and facilitating the registration of the Non-Profit Company.

2017/18 Q3-Q4: Assist in the development of the strategic framework of the cluster as well as the cluster's business plan, which will consist of the following:

- A brief description and map of the cluster;
- A description of the strategic framework of the cluster;
- The main challenges and issues facing the cluster;
- The chosen approach and main steps in achieving the goal/s of the cluster;
- A detailed governance model;
- Determination of the resources required to run a successful cluster, including a detailed budget plan; and
- Key deliverables and timelines.

Lead departments/agencies: the dti, Plastics SA, Municipalities

Supporting departments/agencies: EDD, IDC

3. Plastic Exports and Import Replacement Programme

Nature and purpose of the intervention

The focus on increasing exports derives from the fact that South Africa has a relatively small plastics market geographically distant from larger developed markets, and with no strong drive from consumers to buy locally manufactured plastic.

The plan, therefore, is to increase exports into Africa are part of government's broader regional integration strategy. It is envisaged that an increase in exports, especially value-added plastic products and services, will contribute to sectoral growth and employment and greater local capacity and capabilities.

Targeted outcomes

Reduction of the growing trade deficit in plastics through increasing regional exports and import replacement.

Key milestones

2017/18 Q1 and Q2: Gather market intelligence on African export markets for niche plastic products. Analyse the basic basket of imported plastic products and identify products that impede local production.

2017/18 Q3-Q4: Develop an export report emanating from countries visited, highlighting opportunities and the 'culture of doing business' in those countries; develop local capability in products that have high import value and a viable business case.

Lead departments/agencies: the dti (IDD and TISA), Plastics SA, TIA

Supporting departments/agencies: EDD, IDC, SABS, DST, SARS

4. Trade Policy Measures

Nature and purpose of the intervention

The Plastics Industry has recently highlighted custom fraud issues that have been prevalent in the sector. A number of products are imported through the misdeclaration of tariff codes. The highest import value for finished plastics is recorded under Tariff subheading 3926.90.90, which is 'other' under 'other'. This is significant given its potential to displace jobs and decrease growth in the domestic economy.

Targeted outcomes

To reduce the import value under this tariff line and unpack the products coming in under this tariff code with the intention of creating new tariff subheadings to ensure better and efficient monitoring of imported plastics products.

Key milestones

2017/18 Q1 and ongoing: Analysis of tariff subheading 3926.90.90.

2017/18 Q3: Application to SARS to create new tariff subheadings for identified plastic products that are manufactured locally but do not have a proper tariff subheading; and to harmonise trade going forward.

Lead departments/agencies: the dti, Plastics SA, ITAC, SARS

Supporting departments/agencies: EDD

6.2. Pharmaceuticals and medical devices sector

6.2.1. Pharmaceuticals

Situational Analysis

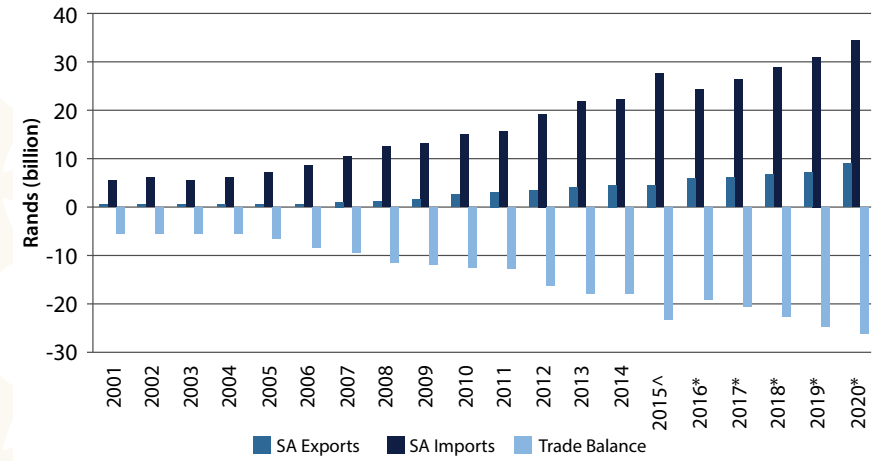
The global pharmaceutical market is worth US\$300 bn a year and is expected to rise by 33,3% to US\$400 bn by 2019. The USA is the dominant player in the market, owning six companies in the global top 10. North America, South America, Europe and Japan account for 85% the global pharmaceuticals market and this trend is expected to remain constant, given their acquired advantage of increased economies of scale as well as patent protection.

The South African pharmaceutical sector is the largest drug market in Africa, with the fifth highest expenditure on pharmaceuticals per capita. The total market value in 2015 was estimated at R44 bn with R34.2 bn (86.7%) attributable to the private healthcare market and R6.8 bn (13.3%) to the public sector.



Figure 1 shows the value of South African exports and imports from 2001 to 2019 in Rands and US Dollars. South African pharmaceutical trade has always been characterised by higher levels of imports than exports, thus an increasing trade balance deficit. In 2015, pharmaceutical imports accounted for 85% of the country's total pharmaceutical trade, despite the depreciation of the rand against hard currencies.

Figure 1. South Africa's trade in pharmaceutical products



Data Extracted from: Trade Map, 2016; Quantec, 2016; BMI 2016a & BMI 2016b

Asian and European markets remain the main sources of South Africa's pharmaceutical imports. However, the country's pharmaceutical exports have recently improved. In 2014, exports of pharmaceutical products amounted to R4.641 bn, showing an improvement from R3.323 bn in 2011. It is expected that by 2019 South African exports of pharmaceutical products will become increasingly competitive, expanding further to reach R7.1 bn, based on improved industry productivity and a relatively favourable exchange rate.

As just noted, the attractiveness of South Africa's pharmaceutical exports will depend on the efficiency of manufacturing firms and the relative weakness of the exchange rate, which makes exports attractive. However, the weakened exchange rate might have an undesirable outcome as it may impact on the imports of active pharmaceutical ingredients (API), potentially raising the price of key medicines.

On the other hand, since the African continent has become the main destination for South African exports of pharmaceutical products, it is expected that more multinational corporations (MNCs) will continue using South Africa as a platform to explore the opportunities in the African market.

Despite improvements in the local pharmaceutical manufacturing sector, the country continues to import most of its pharmaceutical products. The gap between imports and exports of pharmaceutical products continues to grow and imports are growing at a faster rate than exports. In 2015 pharmaceutical imports accounted for 85% of the country's total (two-way) pharmaceutical trade, despite the depreciation of the rand against global currencies.

Imports of pharmaceutical products remain crucial in South Africa as the focus of the local manufacturers is on antiretroviral (ARVs) and other essential (generic) medicines. The international market remains the main source of other important products that are not yet manufactured nationally.

The country's export basket largely comprises medicament mixtures (mostly APIs), making up 70% of total pharmaceutical exports in 2015, followed by medicament mixtures not for dosage at 11,3%. Medicament mixtures not for dosage have grown faster (40,7%) than other export categories, while exports of pharmaceutical goods, specified sterile products, sutures and luminarias have declined by a wide margin, especially in 2015.

Notably, South Africa is the only country in SADC that meets the Good Manufacturing Practice standards of the World Health Organization (WHO). Furthermore, the SADC free trade area ensures tariff-free access to neighbouring markets which continue to rely on South Africa as their main source of pharmaceutical products.

Approximately 276 companies are licensed by the DoH and the MCC to manufacture, import, export or distribute pharmaceuticals. Domestic pharmaceutical manufacturing companies almost exclusively produce generic products and are import dependent. According to Impact RX, in 2015, the generics market in South Africa was valued at R11.7 bn (representing 35.3% of the market by value and 49.4% by volume). Originator medicines were valued at R16 bn, representing 48.2% of the market by value and 29.7% by volume).

High disease burden ensures increasing demand for drugs, especially anti-retroviral drugs. South Africa's rapid urbanization, sedentary lifestyles and dietary trends ensure long-term demand for pharmaceuticals that target chronic, lifestyle-related diseases.

Role-players in the sector believe that they can make a meaningful contribution to stimulating domestic growth and attracting foreign direct investment. The consensus amongst the major pharmaceutical companies is that there is an urgent need for policy certainty and consistency, a substantial reduction in the delays for products to be registered and support for local production - together with strategic tariff remedies and incentives to level the domestic playing field. Interventions focusing on the above issues need to be considered to provide concrete incentives to grow the local manufacturing industry.

Key opportunities

- Increasing local production of medicines;
- Employment creation;
- Creation of new export and local markets for local producers.

Challenges

Some of the core challenges facing the sectors' development are highlighted below

- Shortage of required skill sets in the Medicines Control Council. (Hence the excessively long period required for the registration of medicines through the MCC and the lengthy process required for the approval of clinical trials). These are long-standing problems.
- Currency weakness – which, while assisting exports – on the down-side increases the cost of imported active pharmaceutical ingredients (API's) which are key ingredients in the local manufacturing process.
- Level of Single Exit Pricing (SEP) increases which do not adequately cover pharmaceutical companies cost base (of which currency is a substantial driver). SEP for pharmaceuticals makes this the only price-regulated component of the private healthcare market.

For an industry largely dependent on imported materials, the implementation of the SEP pricing and the annual adjustments do not have the flexibility to compensate manufacturers for significant shifts in exchange rate and other cost increases, causing a steady erosion of margins.

Key action programmes

1. Increased capacity to support efficient regulatory approval and registration of medicines

Nature and purpose of the intervention

The MCC will be replaced by SAPHRA - and with this change it is expected that serious progress can be made in addressing the skills shortage and cutting the current backlog in the registration of medicines.

Targeted outcomes

A prioritised approvals processes to achieve the following goals:

- Incentivise pharmaceutical companies to produce locally – an agreement could be reached to fast-track any MCC processes involving locally manufactured drugs and molecules.
- Fast-track approval for post-registration amendments.
- Facilitate the increased local production of medicines for supply domestically, within the region and internationally.

Key milestones

2017/18 Q1-Q2: Explore best practice used in other jurisdictions to accelerate the pace of medicine approvals and fast tracking registrations of domestically produced medicines. Building on lessons from the research phase, develop a recommendation for implementation in South Africa as informed by the analysis.

2017/18 Q3-Q4: Prepare a recommendation document to Cabinet that outlines the capacity requirements and the other considerations for a preferential system for local manufacturers and the regulatory mechanisms that will need to be implemented.

Lead departments/agencies: the dti, DoH, MCC/SAHPRA

Supporting departments/agencies: EDD, Industry Associations, DST, etc.

2. Biopharmaceuticals Innovation Forum

Nature and purpose of the intervention

Biotechnology in South Africa is dominated by research projects, science councils and small biotechnology firms. There are no large, integrated biotechnology firms to speak of that are indigenously South African. Multinational corporations have a presence, albeit mostly through their distribution and marketing partners. Their research and technology development are usually conducted elsewhere.

The most successful and mature bio-economies, such as the United States of America and Switzerland, use a model that focuses on creating an enabling environment for biotechnology and related fields by implementing a suite of incentives to stimulate innovation and allow all stakeholders – government, industry and academics – to interact and extract value from biotechnology.

Innovation is the main driver of economic growth through increased competitiveness. This intervention will aim to facilitate investment in R&D and potential commercialisation of research outputs into improved goods, services and processes for the market.

Targeted outcomes

- Establishment of a biopharmaceuticals innovation forum to improve the interface between HEIs, SCs and industry, thereby promoting potential partnerships for investment in R&D, commercialisation of technologies, skills development etc.
- Improved access to SPII, THRIP and improved implementation of NIPP and EE programmes in support of R&D locally.

Key milestones

2017/18 Q1-Q2: Identify gaps and challenges in the biopharmaceutical R&D and innovation space and partner respective stakeholders to overcome these barriers at either a HEI, SC or industry level.

2017/18 Q3-Q4: Establishment of a biopharmaceuticals innovation forum with relevant stakeholders including government, industry, academia and science councils to collaboratively explore mechanisms to address the gaps and challenges in this space.

Lead Departments/Agencies: DST, TIA, SHIP, IPASA

Supporting departments/agencies: the dti, EDD, IDC, NDoH, Industry Associations etc.

6.2.2. Medical devices sector

Situational Analysis

The medical devices industry is one of the biggest sectors in healthcare, driven by innovation and new technologies. The last decade has seen an unprecedented growth in innovative and improved technologies, which has led to the development of state-of-the-art medical devices and catalysed growth and advancement in the healthcare industry.



The current global market is valued at \$302 bn, up from \$164 bn in 2010, and projected to reach \$440 bn by 2018. Growth drivers include a rising elderly population, epidemiology trends focused on chronic diseases and technology innovation.

The US medical device industry is the global leader with sales of around \$136 bn, which represents approximately 45% of the global market. According to market reports, the US medical devices market is projected to grow at a compound annual growth rate of 6.1% over the next 5 years. There are more than 7,000 medical device companies in the US – most of which are SMEs – but in total they employ around 400,000 people directly and more than 2 million people indirectly.

Western Europe represents more than a quarter of the global medical device market and is led by Germany, France, the UK and Italy. The sector is a major job creator, employing 575,000 people across the EU. Total sales amount to €100 billion. The sector consists of some 25,000 companies, of which 95% are (similarly to the USA) SMEs.

China has recently become the third largest medical device market, growing at an average of 20% annually since 2009. The medical device market is one of the fastest growing market sectors in the Chinese economy. China has several thousand local manufacturers of medical devices, of which 90% are focused on the production of low-tech products like syringes and thermometers. Most high-tech equipment is imported from such countries as the US, Germany and Japan.

By 2020, the Asia-Pacific region, which includes China and Australia, is expected to surpass the European Union and become the world's second-largest medical devices market.

South Africa's domestic medical device industry remains underdeveloped, with imports catering for 90% of the market by value. All the same, the SA medical device market is relatively large - estimated at US\$ 2.9 bn – ranking it in the top 30 in the world.

The market is forecast to grow by a CAGR of 7.7% in the next 5 years, driven mainly by the development and upgrade of hospitals through public-private partnerships and the NHI. Output by the domestic medical manufacturing industry is estimated to be in the region of R2.5 bn - R3 bn, of which more than half is exported.

Although South Africa's medical device manufacturing firms have the capacity to manufacture high quality products, often at very competitive prices, South Africa remains a net importer of medical devices; more than 90% of this market is supplied by imports.

Over the 2010-2015 periods, imports grew at a CAGR of 13.9% in local currency terms. More than 60% of all imports are sourced from just five countries and around half from the top three. The USA remains the dominant supplier, in value terms, accounting for 28.2% of imports in 2015, up from 27.5% in 2014, followed by Germany with 13.7%. Shipments from China have risen sharply over the past five years, boosting China's share to 10.0% in 2014, although it fell back to 9.3% in 2015.

Key Opportunities

- Increasing local production of medical devices and improved balance of trade;
- Creation of new export and local markets for local producers;
- Developing improved health technology innovation capability;
- Geographical location – in relation to Africa;
- BRICS status;
- Nascent medical device and diagnostic expertise and success.

Challenges facing the sector

Some of the core challenges facing the sector's development are the following:

- Disease burden;
- Economic constraints;
- Regulations not yet promulgated;
- Shortage of appropriate skills;
- Currency weakness which increases the cost of imported devices, diagnostics and equipment;
- Geographic location – in relation to developed markets;
- Lack of transformation within the industry.

Key Action Programmes

1. Medical Devices Supplier Development Programme

Nature and purpose of the intervention

South Africa's medical device production firms tend to be small or medium sized businesses and often combine distribution activity with manufacturing. Multinational companies present in South Africa often operate in a joint venture capacity with local firms. Most South African manufacturers focus on producing basic medical equipment and supplies.

A growing private sector is one of the key features of the South African medical device market. Close to 70% of the medical practitioners in the country work for the private sector. Nevertheless, 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.

The public sector alone cannot sustain local manufacturers; hence it is imperative that local supplier development programmes be investigated with the private sector to capture an increasing share of the private market - provided the correct mechanisms are put in place, in collaboration with the private sector, to meet the necessary requirements for supply into this sector of the economy.

This intervention – to be carried out in collaboration with the private sector - aims to facilitate increased local production of medical devices for the domestic market as well as regional and international markets.

Targeted outcomes

- Increasing local production of medical devices;
- Empower local manufacturers with the required skills and technology to produce the medical devices required by the private sector;
- Employment creation;
- Creation of new export and local market for local producers.

Key milestones

2017/18 Q1-Q2: Consult with private sector on their procurement policies, supplier database, lists of devices being procured locally and imported.

2017/18 Q3-Q4: Investigate the development of a programme around supplier development for supply into the private sector with medical schemes and private hospital groups.

Lead Departments/Agencies: the dti, private sector and local manufacturers

Supporting departments/agencies: EDD, NDoH, NT, industry Associations etc.

6.3. Chemicals sector

Situational Analysis

The South African chemicals industry is highly integrated, both internally and with many other areas of manufacturing and commercial activity, making it a key strategic sector of substantial economic significance.



Presently, there is a strong local market demand for chemical products; yet the chemicals manufacturing sector has shown consistently weak performance, with its contribution to the total manufacturing sector declining significantly in recent years.

In 2015, the sector contributed about 3.0% to total GDP and 21.9% to manufacturing GDP, a decline when compared to 2014. It remains, however, the largest sector of manufacturing in South Africa, employing 157,706 people, both formally and informally, throughout the chemicals supply chain.

Table 1: Comparison of Key Economic Data for the South African Chemicals Industry, 2014-2015

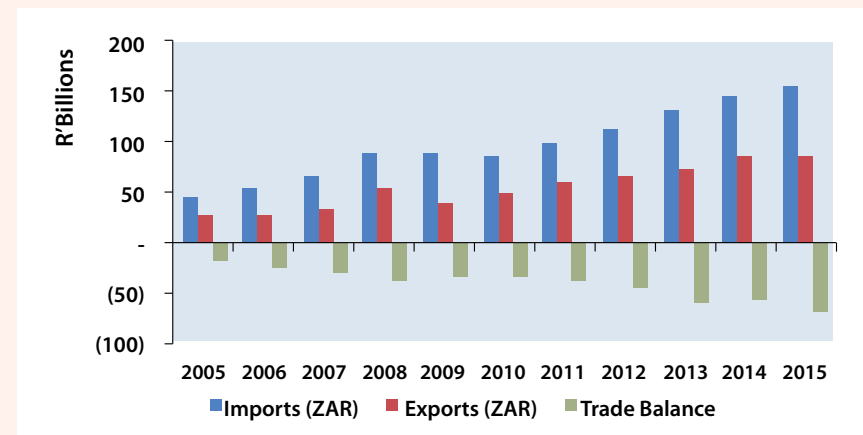
Variable	Contribution in 2015
Manufacturing value-add	>R300 billion
Manufacturing employment	157 706
Trade balance	-R71.2billion

Trade balance

The export value of Chemicals in 2015 was about R86.6 bn compared to an import value of R157.8 bn, leading to a trade deficit of R71.2 bn - an increase of R11.1 bn over 2014.

The trade data show that the organic chemicals and miscellaneous products subsectors are the biggest contributors to the trade deficit. Although the exports showed a slight improvement in 2015, these were offset by a significant increase in imports. This highlights the fact that imports have been the primary beneficiary of local market growth, while the local chemicals manufacturing sector has failed to capitalise on this growth.

Figure 1: Trade Balance for the South African Chemicals Industry, 2005-2015



Sector economic data 2015

ECONOMIC INDICATOR	2014	2015
% Contribution to GDP	3.4%	3.0%
% Contribution to Manufacturing	24.6%	21.9%
Employment	159 460	157 706

Challenges facing the Chemical Sector

Domestic chemical firms face challenges on multiple levels, including:

- Access to appropriately priced feedstock;
- Large volumes of raw chemical materials that continue to be imported and are subject to exchange rate fluctuations;
- Poor and costly logistical service levels;
- Electricity supply shortages and costs;
- Skills shortages;
- Outdated technology and processes used to refine and produce chemicals; hence lower local demand and increased imports;
- Decline in key sectors such as mining, with a corresponding decline in its demand for chemicals.

Key Action Programmes

1. Chemicals Sector Development Strategy

Nature and purpose of the intervention

The problem: significant decline in the economic performance of the chemicals manufacturing sector despite healthy growth in the domestic sales of chemicals.

The current national chemical sector development strategy therefore needs to be urgently reviewed and much better aligned with current economic conditions and the future economic outlook.

The new strategy emanating from the review will serve as a platform to translate key strategic challenges facing the sector into goals and key action programmes that will achieve sustainable growth, increase employment and investment across the sector.

The review will follow two parallel tracks: one with a broader chemical industry focus available in the short term and the other a narrower, more detailed and longer term investigation of the upstream petrochemical industry options that is envisaged will lead to a long-term plan that will be developed over the next 3-5 years. This will, of necessity, seek synergy with the Liquid Fuels Master Plan being prepared by the Department of Energy.

The overall objective is a comprehensive industrial growth strategy for the chemical industry that has high economic impact and spin-offs.

Targeted outcomes

A broad strategy for the wider chemical industry as well as a more detailed petrochemical sector strategy that offer a practical framework for enhanced public and private sector decision making to grow and develop the chemical sector, increasing value addition and employment over the long term.

Key milestones

- 2017/18 Q1-Q4: Initial investigation into the petrochemicals industry to determine the major challenges and issues facing the chemicals sector.
- 2017/18 Q1-Q2: Review of the current South African chemicals industry, including current sector policies, strategies and government interventions.
- 2017/18 Q3: Value chain analysis and prioritisation: comprehensive analysis and benchmarking of policies for each of the prioritised industries.
- 2017/18 Q4: Development and finalisation of the Industrial Growth Strategy for the broader chemicals sector.

Lead Departments/Agencies: the dti, IDC, CAIA

Supporting Departments and Agencies: EDD, DoE, DST

2. Bio-based chemicals development

Nature and purpose of the intervention

Bio-based chemicals are derived or synthesised in whole or in part from biological materials and thus are considered renewable - offering lower environmental risk and pollution during production and use. The use of sustainable resources allows for a more sustainable solution to the problem of resource depletion. At the global level. Therefore, significant steps are being taken to move away from dependency on fossil-based products in favour of bio-based products. Consequently, developed countries are expected to demand higher percentages of biologically-based inputs into the manufacture of final products.

In view of this, although the development of bio-based chemicals in South Africa will require a fundamental shift from the conventional way of producing chemicals – and is in essence a long-term plan - it is critical to begin now with the first steps of development to avoid future trade constraints as developed countries demand higher percentages of biologically-based inputs.

Further to this, it is envisaged that costs, access to raw materials and availability of energy will remain prerequisites for a successful chemical industry. The long-term opportunities to drive growth in the sector are expected to be bio-based chemicals, natural gas processing and agrochemicals.

Therefore, the nature of this intervention is to take the first steps towards bringing together researchers and key chemical manufacturers and creating a conducive domestic environment to allow local chemical companies to begin transitioning to greener products and production techniques. The main purpose is to consolidate future trade as advanced economies are beginning to pass stringent regulations defining safety, environmental and internal market objectives.

The economic advantages of bio-based chemicals include stimulation of the agricultural sector - where job creation is highest - and industrialisation as design, build, and production plants are managed.

Targeted outcome

An enabling industrial policy for transition to greener products and production techniques. This will ensure SA export markets, international competitiveness and job creation opportunities as new production plants are designed, built and managed.

Key milestones

2017/18 Q1: Identify and engage global and domestic companies on the possibility of producing bio-based chemicals in South Africa.

2017 / 18 Q2–Q4: Engage DST on the formation of chairs to research low cost routes in the production of bio-based chemicals.

Drive the bio-based chemicals development through a forum of researchers, government and chemical companies.

Identify commercialisation mechanisms for viable bio-chemicals in South Africa.

Lead Departments/Agencies: the dti, DST, IDC, CAIA, TIA, CSIR, Universities

Supporting Departments and Agencies: EDD, NEDLAC, Global companies

6.4. Cosmetics sector

Situational analysis

The South Africa cosmetics sector accommodates a numerous population of large, lead and dynamic firms, as well as small and micro-enterprises dedicated to the production of lotions, fragrances, cosmetics, soaps, detergents etc.

The sector is classified as one of the biggest personal care markets on the African continent, with manufacturing activity estimated at R5.2 bn in 2014. It employs 60,000 people, with exports of R 12.5 bn and imports of R15.3 bn in 2015.



Sector economic data

Variable	Contribution in 2014
Manufacturing Activity in 2014	R5.2 Billion
Exports 2015	R 12.5 Billion
Imports 2015	R 15.3 Billion
Overall Trade Deficit in 2014	R- 2.8 Billion

Three areas of focus are the aerosols sector, natural ingredients and products; and a bio-manufacturing hub. The aerosol sector in South Africa is incredibly versatile and dispenses a wide variety of products safely, hygienically and efficiently. The industry association is currently not registered with **the dti** and therefore cannot apply for programmes linked to exports for its members. Once registered, the association will be able to address a wide range of economic multipliers such as increased production, increased employment, technology transfer, investment opportunities, local demand and export markets.

The global volume sales of aerosol products was 15.3 bn units in 2014 and is expected to reach 17.83 bn units by 2020. In South Africa, cans produced for personal care were valued at R136.5 bn; household usage R102.5 bn; car care and industrial R8.9 bn; paint R 8 bn; and cans for other industries R5.6 bn. (Total value R261 bn).

The other prioritised sector is natural ingredients. This sector contributed R101 million to GDP in 2014. Global cosmetics and health markets are growing, toward natural and organic products. Consumers globally view natural products as safer and healthier alternatives to synthetic ones and manufacturers respond by developing natural products, include natural ingredients in their formulations.

International buyers agree that South African companies can supply a broad range of value-added and innovative ingredients. The country is a hotspot in terms of biodiversity, linked to a wealth of traditional knowledge on how plants can be used. SA's climatic zones allow for the cultivation of a large variety of plant species to produce natural ingredients.

Key Constraints

- High-level skills with respect to research and development, testing and biodiversity.
- Uncompetitive input prices in aerosol can manufacturing.
- Introduction of cosmetics regulations: manufacturers have to be GMP (Good Manufacturing Practices)-compliant.
- Financial resources to establish a manufacturing facility that will cater for companies that require production of small quantities in the cosmetics sector.
- African market penetration needs knowledge on countries' regulations and market analysis.
- Delays in the issuance of Bio-prospecting Permits in the cosmetics natural ingredients and products sector.

Opportunities

- Technology upgrading and increased competitiveness.
- Product proliferation (new products to market).
- Increased mass market exports (especially to Africa).
- Increased niche market exports (small batch production).
- Employment creation.
- Creation of new markets upstream and downstream (e.g. packaging suppliers, chemical suppliers).

Key Action Programmes

1. Aerosol Manufacturing Development Programme

Nature and Purpose of Intervention

The cosmetics sector strategy has identified aerosol manufacturing as a key area for intervention. At the moment, the cosmetics sector imports most of the aerosol components from the Far East and Europe. The primary reason for this is that local manufacturers have so far been unable to meet the quality standards that are specified by local aerosol manufacturers. The local manufacturers therefore require improved technology and equipment to meet these quality standards. This will present opportunities for local sourcing of aerosol cans by both local and multinational companies.

In November 2016, the Aerosol Manufacturing Association (AMA) achieved the status of a dti-recognised industry association. It will now be in a position to assist companies with market research studies for both local and international markets and will also be able to organise group trade missions that will help market South Africa's products globally. Increased production of cans that meet the required standards of cosmetics companies will contribute to local content.

The sector desk will also work very closely with can manufacturers to promote competitiveness within their companies. Strategic interventions or incentives which will assist in increasing investments in aerosol filling capacity and capabilities should be considered, as excess demand for local production exists. It is important to note that South Africa is the only Sub-Saharan country to have an aerosol filling industry and capability. This therefore presents a significant opportunity which can be leveraged not only in the cosmetics sector but also in the broader consumer goods sector.

Targeted outcomes

- Increasing production of cans output leading to positive contribution to GDP;
- Empower local manufacturers with the required skills and technology to produce cans required by industry;
- Employment creation;
- Develop a self-sustainable industry;
- Creation of new export and local markets for packaging producers.

Key Milestones

- 2017/18 Q1-Q4: Identify and work with local manufacturers of cans to improve competitiveness.
- 2017/18 Q1-Q4: Facilitate access to funding for companies, on investments and exports.

Led by: the dti

Supported by: Aerosol Manufacturing Association (AMA), CTFA, industry.

2. Natural Ingredients Export Development Strategy

Nature and Purpose of Intervention

Global buyers have previously perceived South Africa's natural ingredients sector as very fragmented, with lack of security of supply. Since the establishment of partnerships between industry associations, other government departments, TISA, CBI, PhytoTrade and CSIR - there has been some improvement in the security of supply, and investments in the sector are on the rise. A number of interventions - including trade show participation, training and workshops on the necessary standards for the sector and market access - have contributed significantly to its improved growth.

There is, however, a need for further training in Good Manufacturing Practice compliance. This will be carried out in partnership with SABS and CBI.

The Cosmetics sector desk's ongoing partnership with the CSIR's Bio-manufacturing Industry Development Centre has provided companies with significant opportunities for enhanced R&D and product development. With the export council (CECOSA), CBI and TISA the Cosmetics sector desk will continue to facilitate and promote the commercialisation of natural ingredients and products.

Targeted Outcomes

- Increase the South African market presence of natural products and ingredients like aloe, marula and baobab in international markets, leading to a positive contribution to GDP.
- Clearly identify the sustainable and traceable value chains that meet international buyer requirements.
- Identify dedicated support and business-enabling policies and programmes for natural ingredients and products manufacturers.
- Facilitate the formalisation of the natural ingredients producers' industry.

Key Milestones

- 2017/18 Q1-Q4: 2017-18 Develop Natural Ingredient and Products Strategy that will focus on value-add and export markets.
- 2017/18 Q1-Q4: 2017/18 Implement the export strategy.

Led by: the dti, TISA, Marketing unit

Supported by: PhytoTrade, CBI, CSIR, IDC, CECOSA, SABS, DEA, DAFF, EgoliBio, SEOBi, TUT-TSC, industry and academic institutions

3. Cosmetics Competitiveness Cluster Programme

Nature and Purpose of Intervention

Many programmes and incubation facilities have been established by government to assist cosmetics companies with product design and development for commercial purposes. From these incubation hubs and programmes, many products like hair care, skin care and petroleum-based and natural ingredients products have been developed. However, most of these products are not known and they need a concerted marketing and commercialisation intervention.

Small scale production in the cosmetics industry is not sustainable; volumes are key. This creates an opportunity for private investors to set up a manufacturing hub that can produce new products that have been developed for SMMEs at smaller scales. The hub can be a one-stop shop for enterprises where services like production, market access, technology transfer, logistics, quality standards (GMP) are offered.

The Cosmetics sector desk will lead the process of working with the private sector to facilitate this investment opportunity. The facility will close the gap that currently exists in the commercialisation of cosmetics products developed for SMMEs from incubation centres. The facility's mandate will be to produce products on behalf of companies at smaller scales, transfer skills to the entrepreneurs, assist companies with compliance and market access, including distribution.

Targeted Outcomes

- Small scale manufacturing hub for SMMEs requiring small volumes;
- Empower entrepreneurs with required skills and technology to produce their own products;
- Employment creation;
- Develop a self-sustainable industry;
- Production of cosmetics products locally, with increased local content;
- Support SMMEs in the supplier chain.

Key Milestones

2017/18 Q1-Q2: Identify Cluster members and facilitate registration of the Non-Profit Company.

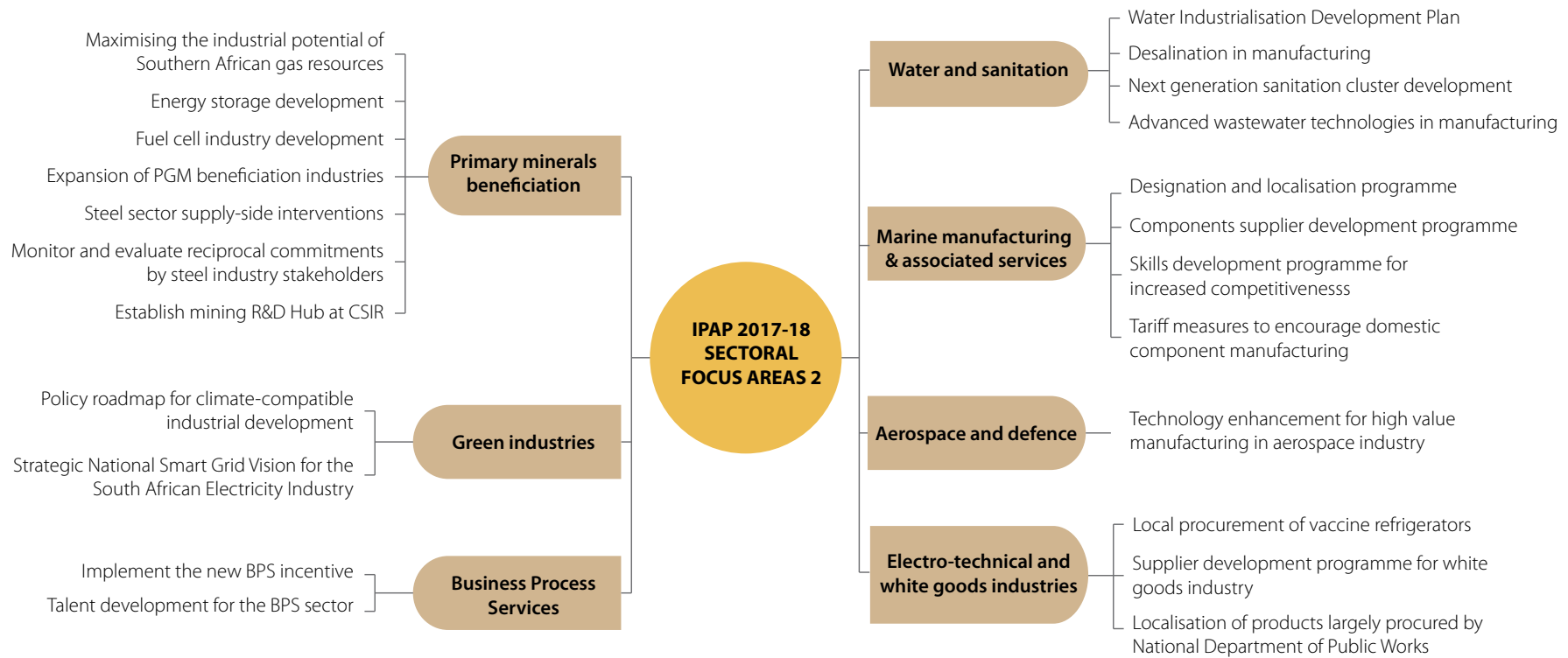
2017/18 Q3: Assist in developing the Cluster business plan/strategic framework.

2017/18 Q4: Implementation of the Cluster's business plan.

Lead Departments/Agencies: the dti

Supporting Departments/Agencies: EDD, TIH, CSIR-BIDC, IDC, SABS, SEDA, SEFA, SEED, TUT-TSC, industry, DSBD

IPAP 2017/18 – 2019/20: SECTORAL FOCUS AREAS 2



7. Primary minerals beneficiation

Situational Analysis

The Mining Sector has been in distress since 2013 because of volatile metal prices and exchange rates, infrastructure access and capacity, above inflation input costs, productivity challenges at many mines, labour instability and the regulatory, political and legal environment. This has contributed to a decline in greenfield activity, illustrated by only 1% of combined company spend being dedicated



to exploration. Midway through the 2015 cycle approximately 50% of the industry was loss-making, with more than 80% of the platinum mines operating at a loss in the last quarter of the year, leaving the mining sector struggling for survival. For three years running, mining companies had to draw down on reserves to fund capital expenditure which declined to R55 bn in 2015, a year that recorded mining revenues declining by 1.3% to R347 bn. (StatsSA).

Minerals exports accounted for 35% of total merchandised exports in 2011; declining to 26% by 2014. SARS statistics for 2015 recorded a slight rebound, to 28%, with a total of R182.82 bn in precious metals exports. The global economic environment remains very difficult for resource-based economies, with sharply lower commodity prices triggered both by decline in global demand and oversupply by major producers. In addition, the lower production of commodities without any cost savings has resulted in unit costs far exceeding inflation. Commodity prices peaked in 2011, slumped from 2012-2015b but showed signs of modest recovery in 2016, as illustrated in the table below.

Table 1. Commodity prices 09/2011 – 08/2016

Ounce	09/2011	04/2012	02/2014	12/2015	08/2016
Gold	\$1898	\$1650	\$1326	\$1062	\$1339
Platinum	\$1905	\$1589	\$1426	\$832	\$1119
Per ton	2011	2012	2014	12/2015	06/2016
Iron Ore	\$168	\$128	\$97	\$39	\$51
Coal	\$124	\$111	\$86	\$62	\$66
Source: www.tradingeconomics.com					

The effects of the decline are being felt worldwide and mining companies are reflecting on the impact of the slowdown of the Chinese growth rate on their commodities. China's recent shift from infrastructure to consumer-driven domestic growth has changed the demand dynamics for different commodities groups. This also has an adverse knock-on effect for the rand's value as commodities are responsible for a high proportion of exports.

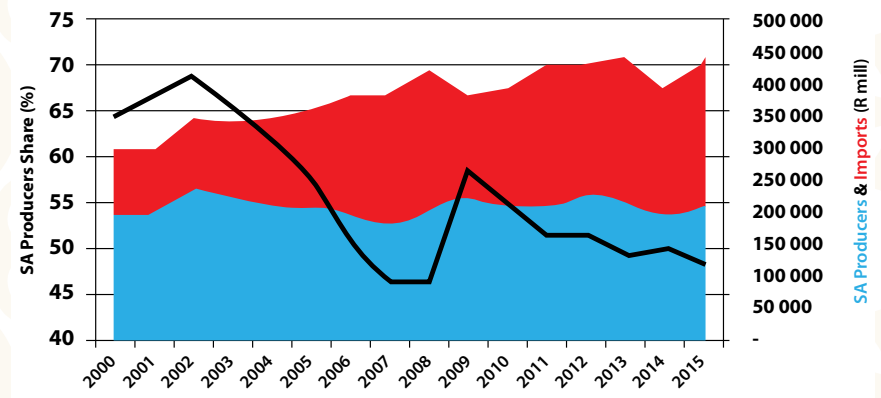
The challenges facing the mining industry are also reflected in the declining JSE Mining Index. The average market capitalisation of the major mining companies on the JSE declined by almost 50% from June 2014 to October 2015 (June 2013=100, INet Bridge) indicating the scale of the difficulties experienced by the sector, in tandem with the stuttering global economy.

The SA steel industry has been particularly hard hit - oversupply and massive installed capacity in the Peoples Republic of China (PRC) has seen a number of countries deploying various measures to protect and preserve steel production capacity. Governments around the world are grappling with the steel crisis.

In SA, the effects of the depressed global steel market are evident across the value chain as the iron-ore mines, primary steel mills and domestic manufacturers and fabricators struggle to cope, sustain jobs and re-create an environment that would encourage fresh investments.

Of particular concern is the impact on the downstream labour-intensive metals and engineering sectors. Total domestic demand for metals and engineering products comes mainly from 3 sectors - mining, construction and automotives. Analysis provided by SEIFSA (depicted in Figure 1 below) shows that domestic demand from these sectors has not declined, but rather remained stagnant. There is a declining SA share of the local market from a high of 70% in 2002 to 45% currently (solid line) due to increased import penetration and a greater share of the market taken up by imports (shown in red).

Figure 1: Total domestic demand for metals and engineering products from mining, construction and autos (SA producers versus imports)



Source: SEIFSA

Had the domestic industry sustained a 65% local-market position, the value of domestic production, in 2010 rand terms, would have been R100 bn higher, in a total market worth R400 bn.

A key focus of the ongoing 2016-2017 steel interventions is working towards a viable, competitive and sustainable steel industry which provides strategic industry support whilst striving to equitably balance the interests of the upstream and downstream players. An integral part in achieving this balance is careful monitoring and evaluation of the primary steel industry's reciprocal commitments to supply cost-competitive steel to SA's downstream industries. In terms of demand, key areas of work will focus on driving local procurement by the mining and construction sectors.

Liquid Petroleum Gas (LPG)

In the absence of natural gas, LPG will continue to service the residential, retail and very light industrial markets in the short term. In May 2016, it was announced that the fabrication of liquefied petroleum gas (LPG) vessels, or 'bullets', for an open access LPG terminal being developed at Saldanha Bay, in the Western Cape, had been completed. The pressure vessels, which were fabricated domestically, will provide 5,500 t of LPG storage capacity at the facility, which will be operational by the second quarter of 2017.

LPG has an important role in the early-stage development of broader gas markets in South Africa. Not only does it introduce more gas into the energy mix, but also provides South African industry with an opportunity to develop its capabilities with respect to the design, and production of gas storage and transmission technologies which will be extremely useful once more gas (via Liquid Natural Gas) is introduced into the energy mix.

Liquid Natural Gas (LNG)

The Department of Energy (DOE) announced in September 2016 that it will be procuring close to 3.5 GW of LNG-fired power, with LNG landing in the ports of Richards Bay and Ngqura (Coega). In addition to power, LNG and natural gas will be made available to industrial users on a third-party basis. As more and more LNG projects come on-stream globally, LNG prices are likely to remain low for a considerable period of time. In fact, changes in the LNG market have seen LNG shift from being a premium energy source to an essential way of developing gas markets around the world. It is thus an opportune time for South Africa to be importing LNG as it should be able to lock in lower prices.

If security of supply can be proved, it is envisaged that LNG/Natural Gas would displace petroleum-based fuels such as Heavy Fuel Oil (HFO), Medium Fuel Oil (MFO), Paraffin, Diesel and LPG in Industrial applications. Not only is LNG/Natural Gas cleaner than some of these fuels; it is also cheaper than some and has superior thermal properties. Natural Gas therefore can improve the efficiencies of many industries currently using sub-optimal fuel sources in their production processes.

The South African industrial sector is under severe pressure, with energy-intensive industries in particular feeling the full effect of this. Notwithstanding other factors, it is immensely important that the DoE's LNG/Natural gas-to-power procurement process be completed as urgently as possible. Otherwise we will face the real prospect of diminishing industrial capacity and demand undermining the massive potential impact of eventual LNG/Natural Gas imports.

Key Action Programmes

1. Integrating the activities of the Mining Equipment Manufacturers of South Africa with key stakeholders in the Mining Hub

Nature and purpose of the intervention

South African mining equipment suppliers have operated within an environment that has been dominated by foreign OEM products. Over the last two decades the mining sector has undergone a dismantling of key linkages that once made it a world leader in the supply and maintenance of mining capital equipment. Similarly, within this well-constructed ecosystem, processing facilities and manufacturing assets had been sold off. South Africa's mining activity shrank at a rate of 1% per annum in the boom years from 2000-8, while the rest of the mining world grew at 5% a year (Source: Chamber of Mines). This demonstrates how lethargic and fragmented the sector has become.

According to PWC's Mining Equipment Productivity Index (2015), domestic mining equipment operates at lower outputs than Australia, North and South America for all classes of equipment, illustrating the conflict between productivity plans based on increased volumes versus those based on cost reduction. Mining companies are increasingly producing less output with a constant unit of input. If there is to be sustainability, the productivity challenge will have to be addressed.

The total capital expenditure of the top listed mines illustrates that there has been a significant decline, from R71 bn in 2013 to R55 bn in 2015 (PWC). However, a more accurate value - based on the dti's assessment of the mines' total procurement of capital goods, consumables and services - is roughly R90 bn. This is significant if all stakeholders aim to increase the proportion of local sourcing by 5-10% through value chain development and optimisation. Most high-value mining equipment is sourced offshore through international contracts with OEMs who often co-invest in R&D activities with mining companies. However, these contracts are being reviewed in order to source parts and maintenance services domestically, with the value-added components remaining with the OEM. The required paradigm shift is to re-position the OEMs as the source of innovation and R&D capability to the sector and not simply the provider of equipment.

While there are at present several stakeholders within the manufacturing segment of the value chain, there is little proactive coordination towards a common agenda amongst these groupings.

The cluster is therefore positioned as a critical industry support mechanism, with the aim of driving local content and coordinating the interests of the mining companies and manufacturers towards a common objective. Key to the success of this initiative is to facilitate collaboration between the supply chain function of the mining companies and the South African suppliers of mining equipment. Government continues to play a critical role in supporting the transformation of the industry.

A comprehensive mining technology and manufacturing development programme will be developed to access un-minable reserves and revive the industry. The next generation of mining systems could significantly extend the life of gold and platinum mines. It is the strategic intent of key role-players in the sector to develop these systems in South Africa and stimulate localised manufacturing. This will revitalise growth within the mining value chain and provide opportunity for supplier development and job creation.

The creation of the Mining Hub (at the CSIR facility in Melville) as the centre for Research & Development within the mining sector, prioritises the interests of the mining equipment cluster. Its key objective will be to create a platform that will:

- a) Establish competitive local manufacturing capability to deliver the systems required for future requirements, by facilitating research collaboration;
- b) Encourage value chain collaboration;
- c) Share knowledge to enhance capability;
- d) Stimulate skills development;
- e) Enable collaborative partnerships for manufacturers in R&D projects.

The future of mining in South Africa and its competitiveness is going to depend on innovative R&D and competitive domestic supply chains. A declining local currency, combined with localised manufacturing to leverage scale in the mining sector, will enhance the sector's ability to compete globally. This will create a favourable economic opportunity for all stakeholders.

Targeted Outcomes

An established and globally recognised Mining Hub at the CSIR facility that will be the central coordinating institution for all mining related R&D activity aimed at developing the mining systems of the future. Activities will be aimed at increasing the overall spend of mining companies on domestic manufacturers. Fundamental to this will be the upgrading of capabilities of domestic manufacturers to produce globally competitive products to the South African mining sector and export market.

Key Milestones

- 2017/18 Q1: Develop the framework for a supply chain strategy to enhance and optimise existing capabilities with leading manufacturers supplying inputs to the mining value chain.
- 2017/18 Q1-Q2: Complete an analysis on the procurement activities of 4 major South African mines. Formulate the business case for 4 products to localise or source from existing domestic suppliers.
- 2017/18 Q1-Q4: Develop and implement a supplier development and a localisation programme in collaboration with the Technology Localisation Implementation Unit and commission 10 Technology Assistance Packages with equipment suppliers, with the aim of increasing mining companies' procurement of locally manufactured capital goods and consumables by 5-10%.

Lead departments/agencies: the dti, DST, CSIR

Supporting departments/agencies: EDD, IDC, DMR, DMP

2. Interventions for a sustainable steel industry

2.1 Monitoring and evaluation of steel pricing principles

Nature and purpose of the intervention

Since the global steel slump began to take effect in 2015, the Inter-Departmental Task Team on iron and steel has been working on several demand-side measures to support and save the industry from the immediate threats of closure and the subsequent loss of capacity.

The support measures - including tariff protection and localisation - are accompanied by reciprocal commitments which will need to be carefully monitored by government and its supporting agencies to ensure that the required structural reforms in the steel sector are indeed being delivered.

Hence the purpose of this intervention: monitoring and evaluation of the reciprocal commitments, respect particularly to the following:

- The flat steel pricing agreement between the primary steel industry and government;
- Investment commitments;
- Job creation and retention;
- Industrial output and supply of primary steel into key sectors of the economy.

Targeted Outcomes

Steel is fundamental to manufacturing in SA, accounting for significant value add and accounting for 190,000 jobs in the direct iron-ore, steel making and fabrication industries. Top steel consuming industries (mining, construction, autos) contribute ~R600 bn to SA's GDP (~15%) and employ ~8 million people (direct and indirect). Being a key input into major sectors of our economy, targeted outcomes of the intervention will be:

- A competitive primary steel industry;
- A fair price for downstream manufacturing;
- Development of local capacity and capability through localisation;
- Investment growth;
- Job creation.

Key Milestones

2017/18 Q1-Q4: Monitor monthly steel pricing in accordance with the agreed flat steel pricing basket.

2017/18 Q1-Q4: Working with EDD/ITAC to monitor the reciprocal tariff commitments.

2017/18 Q4: Annual report assessing compliance with the pricing agreement and impact of reciprocal commitments.

Lead departments/agencies: the dti, EDD, ITAC

Supporting departments/agencies: IDC

2.2 Supply side interventions

Nature and purpose of the intervention

The steel industry in SA was particularly hard hit by the global steel crisis, whose effects were exacerbated by SA's high steel production costs and the impact of administered prices:

- Aged plants and inefficiencies due to lack of investment, maintenance and R&D;
- Energy: electricity and gas price increases;
- Transport/logistics: rail and port charges and inefficiencies on domestic vs export lines;
- Inadequate availability of affordable scrap metal.

A key focus of the Interdepartmental Task Team in 2017/18 will be engaging and developing long term policy, programme and project interventions to address the supply-side issues and support access to inputs for local primary producers:

- Engage Eskom, Transnet and other key users on demand for steel/steel products as well as supply of inputs to intensive users in the steel value chain;
- Develop a proposal for an export tax on scrap metal;
- Develop a collaborative steel R&D forum (led by Mintek) to examine and address key technology development needs across the value chain.

Targeted Outcomes

An optimal 'end state' of a viable, competitive and sustainable steel industry in SA providing industry-wide support and striking a fair balance between the interests of the upstream and downstream sectors.

Key Milestones

2017/18 Q2: Submit scrap metal export tax proposal to NT as per draft guidelines for consideration.

2017/18 Q3: Engage SOC's and other key users to support the use of local steel and steel manufactured components/products in state and non-state procurement.

2017/18 Q4: Steel R&D Initiative developed with key programmes of action.

Lead departments/agencies: the dti, EDD, NT, IDC

3. Expansion of the PGM Beneficiation Industries

The global economic environment remains difficult for producers and exporters of primary mineral resources because of the significant slump in commodity prices driven by overcapacity and reduced demand. This has affected many of the industrial mineral commodities that SA produces, underlining the need to add value and find new uses for our resources. Fuel cells and energy storage technology development have revealed a very high dependence on minerals produced by SA.



The fuel cells industry development initiative is aimed at encouraging an increase in the demand for platinum, with an additional interest to make sure that those new uses generate and support broader industrial development in South Africa and spread platinum-based value addition to other key manufacturing sectors.

3.1 Fuel Cell industry development

Nature and purpose of the intervention

Fuel cells offer much needed new growth opportunities for the platinum mining industry - where renewed development of the platinum market is required to ensure long-term sustainability. With South Africa aiming to achieve a 25% share of the global fuel cell market, a deliberate and focused approach is required to convert the opportunity into reality.

In support of this goal, an IDC-led coordination initiative is bringing together 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 platinum-based reindustrialisation in South Africa. The vision is to establish new industries that will form the base of the South African economy of the future.

Building on the work done by the steering committee thus far in identifying the market opportunities and technologies for prioritisation, in 2017/18, **the dti**, IDC and industry will focus on defining the overall value proposition and critical success factors, preferred technology partnerships and the supporting regulatory and policy framework.

At this stage, key markets identified where SA could potentially participate and secure competitive advantage include the transport/mobile sector, mining capital equipment and combined heat and power stationary applications. The **dti**/IDC-led study on the public transportation sector will be completed in 2017, with a focus on developing a programme of action on using the public transportation sector to catalyse the required demand off-take requirements for the localisation of fuel cells in SA.

Another major initiative is providing support for fuel cell development in collaboration with the mines and OEMs. [See Case Study opposite].

Targeted Outcomes

- Increased beneficiation and value addition to locally produced platinum.
- Quantification of opportunity.
- Localisation through local assembly, key component manufacturing and eventually manufacturing of complete fuel cell solutions.
- Integration of DST HySA initiative that will enable retro-fitting of locally developed technologies into localised fuel cell solutions.
- Recycling of platinum from the fuel cell stacks and auto catalysts (using existing refineries and infrastructure).
- Development of a platinum loan/lease facility to reduce the upfront cost of fuel cells, linked to recycling.
- Supply chain development for chemical fuels such as methanol and hydrogen, together with the associated logistics.
- Fuel cell market development in SA, Africa and internationally.

Key Milestones

- 2017/18 Q1: Final report to identify opportunities for the deployment of fuel cells in the public transportation sector.
- 2017/18 Q3: Development of the value proposition and critical success factors in prioritised market applications, including defining preferred technology partnerships.
- 2017/18 Q4: Assessing regulatory and policy framework and support required.

Lead departments/agencies: the dti, DST, IDC, DOE

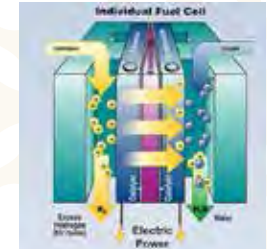
Supporting departments/agencies: EDD

CASE STUDY:

Isondo fuel cell investment to boost platinum demand

With the backing of the dti, **ISONDO PRECIOUS METALS**, headed by CEO Vinay Somera, has invested in a state-of-the-art German manufacturing plant technology for membrane electrode assembly (MEA) currently used by international manufacturing companies.

Last year Isondo kick-started its feasibility study into local fuel cell manufacture, which found that the international market is moving so quickly that the opportunity for local manufacturing is now. The study showed that the developers of proven technology are not able to match SA's lower manufacturing costs - which is the opportunity being targeted.



Isondo is also pursuing private sector venture capital for the balance of its funding needs through Section 12J of the Income Tax Act, which allows investors to claim a 100% tax deduction plus a 70% broad-based black economic empowerment credit. Somera says the company expects to be revenue-generating in the next 18 months. From day one, it will supply into a market that is taking off, driven by the tightening of vehicle emissions legislation and the world's growing hydrogen economy. It is positioning to produce MEA for the international market within a special economic zone (SEZ) in South Africa at lowest cost, using technology that has been developed internationally.

The big issue is to bring down the cost of the technology to make it economically viable for the international market and, importantly, the amount of platinum used also needs to be significantly reduced in order to sustain market growth. The major Hydrogen Council was launched at Davos last month in association with diversified mining company Anglo American, the world's largest platinum producer through Anglo American Platinum.

Edited from original article by Martin Creamer, Editor of MiningWeekly.com – acknowledged with thanks



3.2 Energy Storage Development

Nature and purpose of the intervention

Globally, energy storage is considered essential to future demands on energy generation and stable supply. For SA, energy storage systems offer the ability to complement energy generation from conventional and renewable sources capable of storing production surplus during some periods and meeting higher demand during others. Like fuel cells, significant opportunities are emerging in the form of mineral beneficiation-linked energy storage solutions leveraging key SA mineral resources such as vanadium and manganese.

The IDC has embarked on the development of an energy storage industry development roadmap in partnership with government (**the dti**, DST and DOE), industry associations, ESKOM, the South African National Energy Development Institute, the Energy-Intensive Users Group and the CSIR.

Building on the work done in 2016 of understanding the energy storage landscape, available technologies and international best practices to date, the intention for 2017 is to build on these foundations by defining the critical success factors, SA use cases, value propositions and localisation opportunities. The IDC-led steering committee will also focus interventions on the required regulatory framework and energy storage support programme as well as identifying pilot projects and “quick wins”.

Targeted Outcomes

- Demonstrate sustainable competitive advantages that could lead to localisation within the energy storage value chain, fulfilling the needs of the South African use cases.
- Develop expertise through research and development to sustain competitive advantages and fill identified gaps within the energy storage value chains.
- Beneficiate local minerals for application in energy storage solutions.

Key Milestones

- 2017/18 Q2: Define critical success factors and SA use cases and develop value propositions.
- 2017/18 Q3: Engage stakeholders; assess support required and develop an appropriate policy and regulatory framework.
- 2017/18 Q4: Identify localisation opportunities.

Lead departments/agencies: the dti, DST, IDC, DOE, Eskom

Supporting departments/agencies: EDD, SANEDI, CSIR, industry associations, Energy Intensive User Group

4. Construction

Infrastructure is critical to expanding key value chains across the economy – providing huge potential for the localisation of a wide range of manufactured inputs into the infrastructure build – especially in construction, metals, capital and rail transport equipment.

Significant volumes of steel products and components are procured by state entities such as Eskom, Transnet, PetroSA, SANRAL and in various municipal construction projects. Designation in this sector was implemented to drive local procurement in the construction sector - identified as a key measure to support the primary and downstream steel industry.

The Instruction Note for designation of construction steel products and components has been issued in terms of section 5 of the preferential Procurement Policy Framework Act, 2000 (Act No 5 of 2000) and came into effect from 1 February 2017.

4.1 Monitoring and implementation of designated sectors Instruction Note 15 of 2016/2017: construction steel products and components

Nature and purpose of intervention

Targeted implementation of the Instruction Note: Steel Products and Components for Construction with procuring entities. This intervention will comprise of workshops and engagements with SOCs, national, provincial and local government as well as all other relevant key stakeholders.

Targeted outcomes

- Implementation of 100% steel components for construction by all procuring entities in their infrastructure projects.
- 100% compliance on local procurement of steel components for infrastructure projects.
- Resuscitation of the local steel fabrication industry.
- Job retention and creation.

Key milestones

2017/18 Q1-3: Engagement with procuring entities (SOC's, national, provincial and local government across SA as well as other relevant stakeholders.

2017/18 Q4: Impact assessment report on the implementation of the designation instruction note.

Lead departments/agencies: the dti

Supporting departments/agencies: EDD, NT, SOEs

5. Gas Industrial Policy

Nature and purpose of the intervention

An abundant and cheap natural gas resource has the potential to revive previously stagnant industrial sectors and develop new industries. The stand-out 'benchmark case' would be that of the United States, where cheap shale gas has contributed to a dramatic revitalisation of wide swathes of the manufacturing economy and a very substantial "re-/on-shoring" of manufacturing.



The South African context is however, very different, and requires careful analysis and scrutiny. In pursuance of this, in 2016 the dti launched a Gas Industrialisation Unit (GIU), whose core mandate is to unpack the way gas and – and in particular gas-based industrial enterprise - could assist with the broader re-industrialisation of the South African economy.

During the initial phase the GIU was able to call upon both local and international knowledge and expertise in relation to gas markets, gas-based industries, old and new gas storage and transmission technologies and to identify enabling and disabling policy frameworks and regulatory regimes. Armed with a rich dataset, the GIU developed a broad gas industrialisation road map that will be unpacked in greater detail going forward.

Short-term Opportunity

South Africa has world class expertise in the design and manufacture of gas and cryogenic storage and transmission facilities. There are a handful of South African engineering and manufacturing firms that have been servicing markets within Europe, USA and Africa for some time. For instance, the key materials for the soon-to-be-installed LPG import terminal in Saldanha Bay were sourced using local capabilities and inputs. Such activities provide South Africa with an opportunity to develop into a hub for the design and manufacture of similar facilities for the African region.

Medium-Term Opportunity

The Department of Energy (DoE) announced that it will be procuring roughly 3.5 GW of LNG-based power. The LNG will land at the ports of Nqura (Coega) and Richards Bay. In both ports, there will be Gas and LNG available to 3rd party industrial users. The LNG to power programme has the potential to act as a catalyst for the development of broader and deeper gas markets in the South Africa. However, given the greenfield nature of this industry, the way gas enters and is marketed to industry is extremely important. Thus, **the dti** has an important role to play in developing a downstream gas industrialisation strategy.

Long-term Opportunity

Many of the large International Oil Companies (IOCs) hold significant acreage (off- and on-shore) both inland and around South Africa's coastline. While exploration activity has been on hold - mainly due to low oil prices and uncertainties regarding the upstream legislative framework - this period of inactivity has however, provided **the dti** and the local industry with the opportunity to initiate a process of industrial capability upgrading in preparation for the moment when exploration and production activities re-commence.

Targeted Outcomes

- Develop broader and deeper domestic and regional industrial gas markets;
- Develop an industrial cluster that is capable of servicing the on- and off-shore oil and gas industry.

Key Milestones

- 2017/18 Q2: Develop a local content road map that sets forth a methodology for the implementation of local content along the entire Oil & Gas value chain i.e. from up to downstream and for the off- and on-shore Oil & Gas industry
- 2017/18 Q4: Develop a down-stream industrial strategy that considers:
- Downstream industrial and other gas demand;
 - Gas supply options in the short, medium and long term and its likely impact of prices and consequently the economics of gas-based projects;
 - The role of a gas aggregator;
 - Optimal gas storage and transmission infrastructure;
 - Price of gas relative to other fuels. It is important that this analysis considers that gas potentially offers greater thermal efficiencies than other fuel sources – e.g. Heavy fuel oil (HFO), medium fuel oil (MFO), paraffin, diesel, coal-fired electricity etc.;
 - The likely impact on the broader economy of certain industrial users switching out of petroleum-based fuels to LNG in the short- to medium-term and indigenous gas in the long-term.

Lead departments/agencies: the dti, DMR, Transnet, DoE, NT

Supporting departments/agencies: EDD, IDC, SAOGA, CSIR

CASE STUDY: THE KAROO RESEARCH INITIATIVE (KARIN)

KARIN is an academic research drilling programme undertaken by geoscientists from six of South Africa's leading universities and the Council for Geoscience. The objective of KARIN is to plan and drill three, 2-km deep cores to obtain a full stratigraphic section through the southern and south-western parts of the Karoo Basin.



KARIN is exploring all aspects of this Basin by investigating the sedimentary environments. The study also includes the thermal and structural history and the present physical nature of the potential source rocks, including shale, in conjunction with an environmental analysis.

It is significant to note that the drilling programme and onsite diagnostic testing of the shale source rock were undertaken by South African firms using mainly South African inputs and personnel. Both the research drilling programmes and the onsite diagnostic testing were done at a fraction of the cost of a full-blown Oil and Gas Exploration Programme, with zero environmental and safety incidents reported. Research drilling assists in a) de-risking certain exploration blocks by providing more data at low cost and b) providing South African industry sectors with an opportunity to adapt their capabilities toward this new sector.

KARIN demonstrates that even though on-shore Oil & Gas exploration is relatively new to South Africa (notwithstanding the exploration activities of Soekor) there is a potential opportunity for South African drilling companies (and others) operating within in the mining space to migrate some of their skills and expertise toward the Oil and Gas sector.

Further, the launch of the Mining Hub, located at the CSIR's premises in Melville, provides an ideal Research & Development platform for stakeholders from the Oil and Gas industry, the Mining industry, government and academia to develop bespoke solutions for the on-shore Oil and Gas industry in South Africa - if and when it takes off. This in turn could go a long way towards assisting the Oil and Gas sector both to achieve local content targets and drive down costs in the long run.

CASE STUDY: MASTER DRILLING: GLOBAL REACH, LOCAL EMPOWERMENT

MASTER DRILLING (MD) is a world leader in specialised global drilling solutions, with 30 years' experience in providing raise boring and exploration (slim hole) drilling, together with specialised in-house drilling equipment design, manufacturing, training and maintenance capabilities which support its clients' unique needs.



MD's international operations span the world: Africa, Latin America, the USA and Sweden. MD also has an office and warehouse facility in China, where specialised capital equipment is produced and procured. About 2,000 employees are employed by MD globally.

At the forefront of the drive towards mechanisation, MD has embarked on an automation programme using in-house technology to enable fully automated insertion and removal of drill rods and automatic remote controlled spanners. MD offers its clients an accelerated timeline in terms of project development and machine development. Sourcing a machine from an original equipment manufacturer typically takes between two to three years. Given its capacity to design, develop and service machinery, MD can deliver a machine in one to two years. The accelerated development timeline, improved safety and reduced labour complement offered by MD's technology help unlock reserves and bring mines closer to filling their installed production capacity.

One specific example of this capacity is Sibanye Gold's Kloof mining where MD is currently deploying a 10-ton tunnel borer 2.1 metres in diameter to create a 70-metre inclined tunnel on a gold-bearing reef. The RD-8 is one of the largest raise boring rigs in the world and is designed and manufactured specifically for large diameter raise boring applications, for shafts up to 8 metres in diameter and 1.5 km deep in hard rock. A BB-BEE ownership scheme benefits MD's South African HD employees. A 26% shareholding in each of MD South Africa (MDSA) and Drilling Technical Services (DTS) was issued to Mosima Drilling (Pty) Ltd, a BB-BEE owned and controlled company. In Master Drilling Exploration (Pty) Ltd, a 26% shareholding was issued to Epha Drilling (Pty) Ltd, another BB-BEE-owned and controlled company. The DCP BB-BEE Foundation - a trust formed to provide welfare, humanitarian, educational and development assistance to disadvantaged communities - holds 20% of the shares in Epha Drilling and Mosima Drilling.

8. Green industries

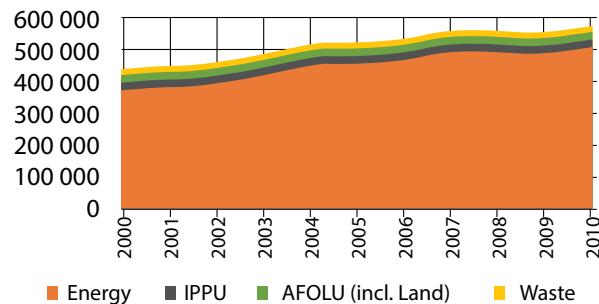
Situational analysis

In line with global trends, South Africa has embarked on the necessary transition to a climate-compatible economy. The South African government has pledged to peak, plateau and decline the country's greenhouse (GHG) emissions in the coming decades.



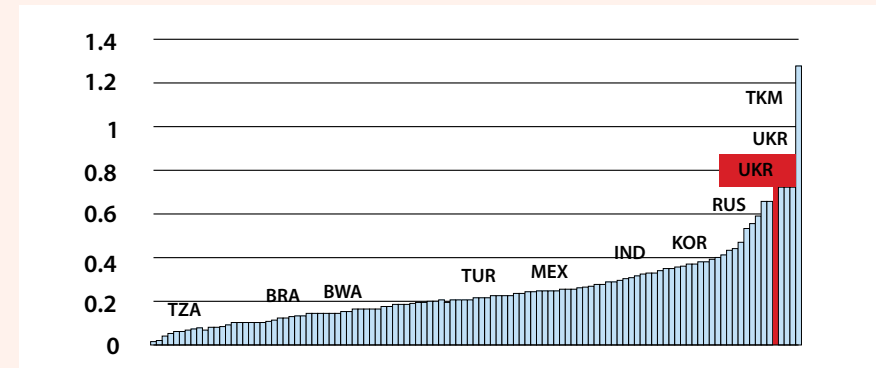
As illustrated in Figure 1, the country remains however one of the most carbon-intensive economies in the world. Government policies and strategies have historically supported the development of fossil fuels (primarily coal) and energy-intensive value chains, leading to the entrenched domination of coal-fired electricity generation, carbon-intensive transport systems and energy-intensive industries.

Figure 1. Carbon intensity per country (in kgCO₂eq per GDP (2011 USD) based on purchasing power parity)



Source: TIPS, based on data from the World Bank
 Note: TKM: Turkmenistan; ZAF: South Africa; RUS: Russia; KOR: South Korea; IND: India; MEX: Mexico; TUR: Turkey; BWA: Botswana; BRA: Brazil; TZA: Tanzania

Figure 2: South Africa's GHG emissions per sector from 2000-2010



Source: TIPS, based on data from DEA, 2013
 Note: IPPU refers to Industrial Processes and Product Use

South Africa is a signatory to the United Nations Framework Convention on Climate Change (UNFCCC) and submitted its Nationally Determined Contributions (NDC) in 2015. Furthermore, SA affirmed its obligations to reduce GHG emissions by ratifying the Paris Agreement in November 2016.

The Department of Environmental Affairs implemented a carbon budget system in 2016 as envisioned in the National Climate Change Response White Paper. This followed on from Cabinet approval of the South African Mitigation System Framework in 2015. The carbon budget is one of several measures being implemented to achieve the overall national greenhouse gas emissions reduction goal.

Against this background, the transition to a climate-compatible development pathway is not an environmental issue but a socio-economic and developmental challenge which has ramifications at all levels of economic development, notably trade and industrial development. It is both an opportunity for new market development and a risk-management strategy to maintain the South African economy's access to existing markets and financing.

Shifting towards a low-carbon model of development has implications in terms of what is produced as well as how it is produced. It implies two complementary streams: namely a) the development of new, green industries (notably to replace industries which may be progressively phased out); and b) the greening of existing traditional industries.

First: a change in South Africa's energy supply systems is inevitable. As shown in Figure 2 above, the energy sector accounted for about 80% of South Africa's GHG emissions in 2010. This largely resulted from coal-fired electricity generation, followed by road transportation. Overall, electricity generation accounted for more than 43% of the country's GHG emissions over the period.

Second: the progressive introduction of new electricity supply technologies is a key opportunity from an industrial development perspective. The rollout of large-scale renewable energy plants since 2011, through the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP), has attracted more than R200 bn of investment, with limited but valuable spillovers for local manufacturing and economic development.

South Africa's potential for small-scale and embedded generation, particularly rooftop solar photovoltaic systems and smart grids (see the SANEDI case study below), is also a massive opportunity for domestic manufacturing.

Third: government has been evaluating the possibility of commissioning substantial nuclear power capacity over the coming decades. If this comes to pass, opportunities could arise to localise a noteworthy share of the production process, leveraging South Africa's large uranium reserve, nuclear energy experience (with the Koeberg power station and the PBMR programme) and associated industries.

Fourth: significant emphasis has been put recently on the development of a gas industry in the country – see Gas Industrialisation above - on the back of large scale Southern African regional discoveries and potential shale gas reserves in the Karoo Basin.

South Africa's existing oil and gas and petrochemical industries as well as capital equipment manufacturers provide a platform for further industrialisation. Last, the country is exploring the potential of a hydrogen economy (primarily fuel cells), as a new market for the country's leading reserves of platinum group metals.

To leverage the reshaping of energy systems for industrial development, long-term certainty and critical mass are required. A lack of policy certainty about the scale and future of the renewable energy programme has notably jeopardised the progress made in attracting foreign investment in manufacturing capacity in this area.

Similarly, long-term certainty would be required to build manufacturing capacity adequate to service any envisaged large nuclear, gas and hydrogen programmes.

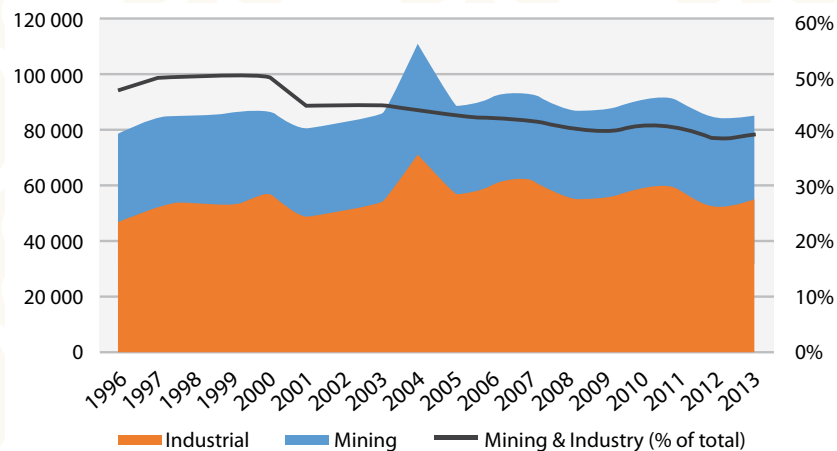
Fifth: the transition to a climate-compatible development path requires a re-shaping of South Africa's transportation systems. Accordingly, government is currently designing a Green Transport Strategy, where the opportunities are particularly evident in the sphere of private transportation. South Africa has embarked on an ambitious rollout of Bus Rapid Transit systems in 12 municipalities. The scale of the infrastructure as well as the number of buses required constitutes a key opportunity to further stimulate the local construction and automotive industries.

The development of electric and gas-based vehicles in South Africa is also slowly picking up, presenting another set of manufacturing opportunities in the country. A coordinated approach is, however, required to ensure that these massive investment programmes generate adequate local manufacturing opportunities. At the same time, South Africa has expressed the ambition to introduce biofuels, through mandatory blending requirements. The absence of an adequate regulatory framework and support mechanisms for small-scale farmers has hindered the emergence of such industries in the country so far.

Sixth: the transition implies a complex balancing act for South Africa's industrial value chains with direct short- and long-term consequences on their business models, as well as modern economic and social structures. Indeed, while industrial activities, including mining, only contributed to slightly more than 6% of South Africa's GHG emissions over the 2000-2010 period, industrial activities are significant energy consumers, indirectly driving GHG emissions.

A limited number of energy-intensive industrial consumers account for a large share of electricity consumption in the country. Eskom reported that, during 2014/2015, 2,773 industrial and 1,034 mining companies respectively consumed 25% and 14% of the utility's electricity output, as depicted in Figure 3 below.

Figure 3: Electricity consumption by mining and industrial sectors in South Africa from 1996-2013 in gigawatt-hour (left axis) and percentage of total consumption (right axis)



Source: TIPS composition, based on Eskom's data

Note: The category "Industrial" essentially refers to smelters, petrochemical operations and paper production

The concentration of energy consumption into a limited number of firms lays the ground for a rapid rollout of resource-efficient technologies and processes (in terms of energy, water and carbon). Notable progress has already been made, stimulated by the National Energy Efficiency Strategy and the support of government programmes like the NCPC-SA (see Case Study).

Nevertheless, more room exists to improve the performance of local industries in this respect, notably through the development of a vibrant energy services industry and sustainable waste management practices.

For a number of (energy- and/or carbon-intensive) industries, the implementation of resource efficient technologies requires going beyond the traditional low-hanging fruits approach towards an embrace of new, disruptive processes. The cutting-edge nature of such processes requires substantial support from government, particularly in the current economic context.

More broadly, the rollout of resource efficient technologies and processes in South Africa represents an important platform for industrial development as a whole. For example, in the construction industry, the push towards 'green buildings', incentivised by the compulsory requirements introduced in 2011 for new buildings, could drive manufacturing in numerous sub-sectors, such as lower-carbon cement, energy efficient lighting, insulation products, low-carbon glass products, green architecture and design services, waste management and cutting-edge ICT.

In sum, the transition to a climate-compatible industrial development trajectory involves a deep transformation of the economy. On the one hand, it constitutes an opportunity to improve the efficiency and competitiveness of domestic industries and grow new industrial segments in both the secondary and tertiary sectors. On the other hand, it involves a structural transformation of the local industrial fabric, with the probable phase-out of some economic activities in the long run.

Government has a key role to play in both cases: to unlock the potential of new activities and provide soft-landing and reconversion strategies to endangered sectors, particularly those that make a sizeable contribution to the country's socio-economic development. Governmental action is critical to ensure that the transition to a low-carbon industrial development is growth-orientated and value-adding, pro-employment and inclusive.

SUCCESS STORIES

Industrial Energy Efficiency Project (IEE)

The NCPC-SA also implements the Industrial Energy Efficiency (IEE) Project, in collaboration with UNIDO and several other partners. The initial phase of the IEE Project (2010–2015) came to an end in December 2015. Funding was secured through the Global Environment Facility and **the dti** for a second phase (2016–2019). A total of 160 companies benefitted or participated in the first phase of the project.

A total of R486.4 million was saved during 2015/2016 by 40 companies participating in the project, bringing total energy savings related to the IEE project to R1.7 bn (or 2,120 GWh). The project also resulted in the retention or creation of 1,744 jobs.



Industrial Symbiosis Programme

Complementarily, the NCPC-SA's Industrial Symbiosis Programme (ISP) facilitated its first waste exchanges and realised savings for companies during the second half of 2015. There are already 2,558 resources registered from 243 companies on the ISP database, primarily in Gauteng (1,717) and KwaZulu-Natal (65). In Gauteng alone, waste exchanges have already reduced the use of virgin resources by 235,000 tonnes.

Skills Development

Since 2010, the NCPC-SA has trained 3,400 professionals in resource efficiency and cleaner production. Two occupational qualifications in energy efficiency were developed and final curriculum submitted to the Quality Council for Trades and Occupations (QCTO) for registration by SAQA on the NQF. The NCPC-SA was awarded top honours in the national skills development field, as the winner of an Achiever Award in the category "Best Training Provider in the Public Sector" at the 10th Annual National Skills Summit and Achiever Awards in 2016. It was also runner-up in the category "Best Training Partnership Programme" in recognition of its partnerships with UNIDO, SECO, GIZ and others.

Internship Programme

The NCPC-SA's RECP internship programme has contributed both to the development of green skills amongst the youth, and the saving of resources in industrial plants. In the past four years, 63 engineering and environmental science graduates have been trained in resource efficient and cleaner production, and placed in manufacturing plants to assess and implement energy, water and materials improvements. This resulted in identified savings of R85 million and actual savings of R14.7 million achieved so far through implementation.

Sector Guides

Four sector / thematic guides were developed during 2015/16 and five instructional videos were developed in 2016/17. These included:

- An Energy Management Systems (EnMS) Implementation Quick Guide;
- RECP Best Practice Guide for the Valve Manufacturing Industry;
- RECP Quick Guide for the Textile Sector; and
- RECP Best Practice Guideline for the Clothing Industry.

These are distributed to companies to guide them on how to identify and implement basic RECP interventions; and the videos are available on social media and the NCPC-SA website.

CASE STUDY: SANEDI SMART GRID PROGRAMME

Implementation of Smart Grids at Naledi Municipality, Vryburg (FS)



In 2014, in partnership with the European Union, SANEDI launched several pilot projects to introduce smart grid technologies and methodologies in South African municipalities. Interventions are focused on the installation of advanced metering infrastructure, supported by energy balancing, customer segmentation, tariff redesign, integrated value chain management, back-office integration and fundamental asset management.

The Naledi municipality in the Free State is one of nine participating municipalities in the project. The municipality, which covers an area of approximately 7,264 km² - with a population of 66,781 split in 18,572 households - faces severe electricity supply issues. In 2010, the municipality reported technical and non-technical losses of about 26% as well as a total of 1,356 electricity meters being by-passed, with dire consequences for its finances. Following the drafting of a turnaround strategy, a revenue collection unit was established. However, finances remained problematic, due to cash flow challenges linked to the need to settle its Eskom debt.

A smart metering system, consisting of 5,000 single-phase meters and 500 three-phase meters, was deployed from 2014 onwards to curb operational losses as well as help the municipality collect revenues more accurately and take control on its accounts. Naledi chose a live system to allow for communication between the municipality, the consumer and the meter.

Anti-tampering modules built into the smart meters have enabled the municipality to immediately detect a compromised meter. Despite a number of challenges - primarily the lack of technical skills and poor supply chain management - the municipality has already seen results from the establishment of a fully operational back-office system and the deployment of just 80% of the planned meters.

Electricity financial losses decreased from 23% in 2014 to 16% in 2015. Eskom is now paid in full every month for the current account and an agreement was successfully reached with the national utility to settle the arrears. Tampering has dramatically declined, particularly by large users such as supermarkets. For example, one area which experienced 39% tampered meters is now free of electricity theft.

Going forward, it is envisaged that successful project can be replicated in other municipalities and transformed into "How-to" Guides on the various types of smart grid components and support systems that can be deployed.



Key Action Programmes

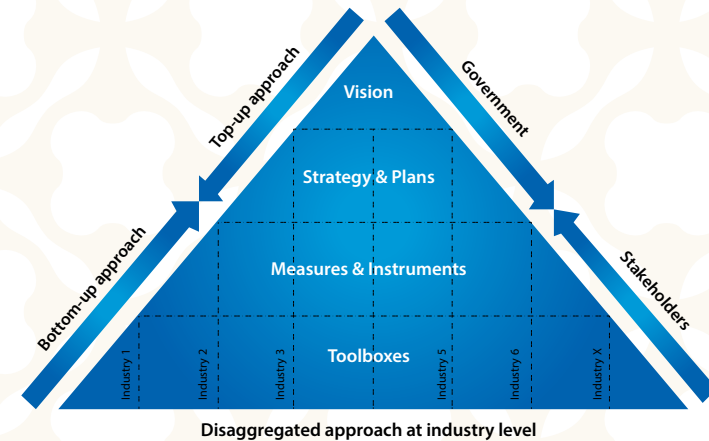
1. A policy roadmap for a climate-compatible industrial development

A Key Action Programme in IPAP 2016/17 – 2018/2019 was the research conducted on how to foster industrial development in the South African green economy. Over the past few years **the dti**, supported by TIPS, has conducted instrumental research on the interplay between climate change and industrial development.

In 2014/15, a project on “Setting South Africa on a Green Growth Path: A Benchmarking Exercise on Climate Change Mitigation Measures and Industrial Development” provided an international review on the transition to a climate-compatible industrial policy, highlighting the need to align South Africa’s industrial development and climate change policies.

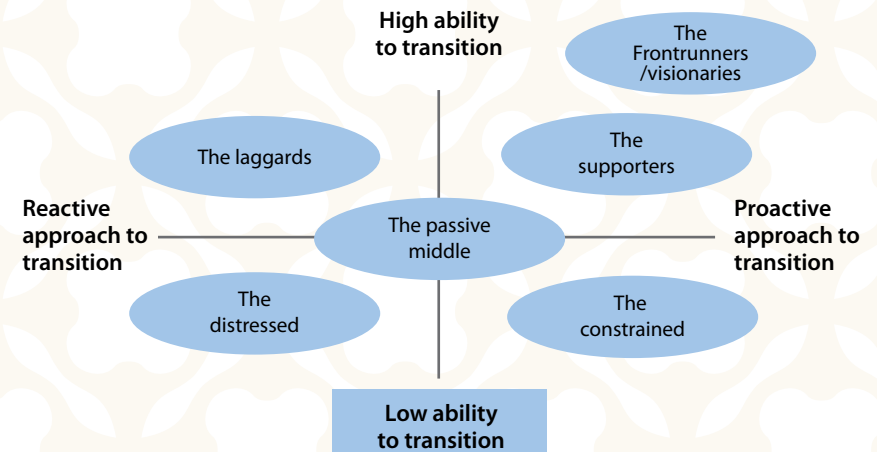
A further project on “Designing Policy Frameworks for a Climate-Compatible Industrial Development Transition in South Africa”, carried out in 2016/2017, conducted a critical ‘policy pyramid’ analysis of South Africa’s industrial policy from a climate change perspective (see Figure 1). The research also formulated a typology of firms’ climate compatibility and a roadmap to develop a climate-compatible industrial policy in South Africa (see Figure 2).

Figure 2. The policy pyramid approach



Source: TIPS 2016

Figure 2. A typology of firms’ climate compatibility



Source: TIPS, 2016

This work highlighted the finding that systematically including climate change-related considerations into South Africa's public policies will require a massive and disruptive shift from traditional practices.

First: the research formulated the need to cast a vision for South Africa's transition to a climate-compatible industrial development. This overarching strategic level is designed to underpin all other intervention levels, providing the framework and the overall direction for the country's transition to a climate-compatible economy. The imperative of establishing sector-specific visions and roadmaps, particularly for sectors most at risk, was identified as a priority.

Second: from a policy and institutional perspective, a pressing need was identified to improve the consistency and alignment of multiple plans and strategies impacting on the transition to a climate-compatible industrial development.

Third: at the implementation level, the work identified an opportunity to improve the complementarity of existing as well as upcoming measures and interventions targeted at the transition, particularly from a competitiveness perspective.

Fourth: a strong emphasis was placed on the importance of building toolboxes which lay the foundation for evidence-based policy- and decision-making, as well as effective and enforced monitoring of implementation.

Finally: the work emphasised the need to integrate both top-down and bottom-up approaches to policymaking in a dynamic and iterative fashion, suggesting a cooperative governance framework including government and other stakeholders (business, labour and civil society) based on constant policy dialogue, engagement and co-development.

These processes are aimed at managing a balancing act, consisting of transitioning enough to maximise the benefits of transition whilst minimising the risks associated with not transitioning; in line with South Africa's capabilities and recognising both threats and probable short-term trade-offs.

Targeted outcomes

The establishment of a long-term climate-compatible industrial development vision (as part of a broader economy-wide vision), along with a clear roadmap detailing the key steps towards achieving the vision.

The implications of the transition cannot however be generalised. They are nuanced and differentiated between sectors, and even between firms or groups of firms within a sector or a value chain.

Firms can be differentiated based on their relative ability (or otherwise) to build a climate-compatible business model; and by their fundamental approaches towards the challenges of transition. While some industries have the potential to quickly and cheaply move to a low-carbon business model (such as light manufacturing industries) – assuming the availability of clean energy sources – other sectors, such as the petrochemical industry, cement production and steel-making, face inherent challenges that will not be overcome without technological breakthroughs. Very careful attention also needs to be paid to the inevitably contested nature of the transition, with many firms and stakeholders resisting on the basis of previously achieved favourable political settlements, contesting social compacts and/or citing difficult short-term economic headwinds.

The key implication, in recognising the complexity of the situation, is the need to build climate-compatible visions for industrial development that are explicitly based on differentiated and dynamic roadmaps for each value chain or sector.

Without such a disaggregated understanding, any 'one-size-fits-all' vision would fail to provide appropriate policy solutions.

Key milestones

Building on these initiatives - and with the support and collaboration of TIPS and the DEA - the dti will further develop the work on climate change and industrial development throughout 2017/2018. The focus will be on putting the research findings and recommendations into practical operation, with an emphasis on industry-specific strategies for sectors most at risk.

Along with the DEA, EDD and DST, the dti is also taking part in the work of the United Nations Partnership for Action on the Green Economy (PAGE) in South Africa. This includes a green economy industry and trade analysis conducted by TIPS, aimed at identifying and assessing sectors or industrial segments that offer opportunities for green industrial development.

2017/18 Q2: Designing the implementation framework for the roadmap developed in 2016/2017: this will include building a prioritisation matrix to select priority areas for action (building on the typology developed in 2016/2017); designing a Strategic Analytical Framework to incorporate climate change into sector strategies (and industrial policy more broadly); and conducting a data stocktaking and analysis exercise to identify data and knowledge gaps.

2017/18 Q4: Carrying out two pilot studies at the sectoral level which will put the Strategic Analytical Framework into operation, in collaboration with the relevant sector desks. This work will include:

- developing a profile of the selected sectors (from an economic, social and environmental perspective);
- establishing the climate compatibility of the sectors (notably compared to competitors internationally);
- carrying out a resilience/vulnerability assessment (based on their existing climate compatibility, existing mitigation potential, and their exposure to both direct and indirect climate risks (direct environmental impacts, indirect environmental impacts, climate change response impacts, including market dynamics));
- identifying and assessing possible solutions and formulating an implementation plan, to be reflected in the sector strategy and broader industrial policy (and integrated with DEROs, Carbon budget, PPP/Mitigation plan).

2017-2019: Internal sectoral capacity building within **the dti** on climate change and industrial development. A target of one session per quarter, training 20 people at a time, is envisaged.

Lead departments/agencies: the dti, DEA

Supporting departments/agencies: DoE, EDD, TIPS, NCPC

2. Strategic National Smart Grid Vision for the South African Electricity Industry

Nature and purpose of the intervention

The development of renewable energy and energy efficiency initiatives have been actively supported by government, as evidenced by the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) which, by the end of 2015, had added 6,376 MW of power to the grid and mitigated 7 MtCO₂eq in GHG emissions.

However, continuous, targeted encouragement is required to maintain and fast-track the uptake of new technologies. A key driver is a bi-directional grid connection that allows net metering, i.e. the sale by consumers of excess generated electricity back to the grid through either the municipality or Eskom. The implementation of net metering is essential to reduce the payback period of investment in self-generation and energy efficient technologies and to render investment feasible.

Municipalities, which represent 41% of distributed electricity (in terms of sales), are the most impactful arena for the deployment of smart grid technology and services. An Approach to Distribution Asset Management (ADAM) was approved by Cabinet in 2012, validating an asset turnaround strategy for the electricity distribution industry. At the time, the investment required to address infrastructure backlogs was estimated at R35 bn.

The implementation of ADAM has however lagged, primarily due to fiscal constraints. This delay constitutes an opportunity for South Africa to capitalise on improving understanding of smart grid technologies and adopt the emergent best practices as part of the country's existing infrastructure investment programmes.

The implementation of smart grids would result in numerous benefits. It would contribute to the modernisation of the electricity distribution grid, thereby providing the platform for a reliable, high quality, robust and attractive electricity supply industry. Smart grids notably accommodate all generation, storage and demand response options, including plug-and-play connection (such as plug-in hybrid vehicles). They also increase the opportunities for more efficient, cleaner power production (through micro-grid deployment, distributed energy resources, embedded renewable energy and energy efficient technologies).

Simultaneously, the rollout of smart grids would upgrade South Africa's electricity metering and billing systems, enabling more efficient revenue collection by Eskom and municipalities. From an economic perspective, the rollout of smart grids in South Africa is a key opportunity to stimulate the South African manufacturing and service industries. It would contribute to lower electricity prices and electricity consumption, as well as supporting job creation and economic activity through the localisation of smart grid technologies/component manufacturing and service offerings.

The rollout process is not, however, without constraints. The stalled restructuring of the electricity distribution industry has created a level of indecision in the sector and a certain lack of direction. Further uncertainty arises from the fact that the outcomes of the pending Small Scale Embedded Generation (SSEG) policy and regulations - aimed at enabling self-generation by residential, commercial and industrial consumers - are still unclear.

Targeted outcomes and impacts

- A clear vision for the development and deployment of smart grid infrastructure and associated service offerings in South Africa.
- Facilitation of investment in an electricity network with greater intelligence to enable the integration of renewable energy technologies, thus supporting the transition towards a productive low-carbon economy. It will be executed as follows:
 - developing a vision document aligned to the green economy objectives of **the dti**, to serve as a basis for a more detailed roadmap;
 - setting a strategic direction for the investment in the correct and most appropriate smart grid technologies in the country; and
 - providing proof of concept through case studies undertaken at local government level.

Key milestones

- 2017/18 Q1: Establish a working group with terms of reference incorporating all members of lead departments.
- 2017/18 Q2: Develop a proposal for inclusion into the Smart Grids Vision document that clearly highlights the objectives of **the dti** with focus to green economic development.
- 2017/18 Q3/Q4: Workshop the proposal with relevant stakeholders and incorporate generated input into final proposal.

Lead Departments/Agencies: the dti, SANEDI

Supporting Departments: EDD, DoE, DST, DEA, National Treasury

3. A Strategic Roadmap for green transport manufacturing

Nature and purpose of the intervention

A Key Action Programme in IPAP 2016/17 – 2018/2019 was the research conducted on how to incentive the development of the green transport industry in South Africa. Continued growth within various sectors of the economy has caused the demand for transportation to increase steadily. Since most transportation modes rely heavily on the burning of fossil fuels, this has gone hand in hand with increased environmental pollution in the form of GHG emissions and the deterioration of local air quality.



Building sustainable transportation systems requires a multi-faceted approach based on reducing or avoiding travel or the need to travel, shifting to more environmentally-friendly modes of transport, and improving the energy efficiency of transportation modes and vehicle technology.

The dti's research focused on the latter component and provided a high-level framework for policy direction aimed at promoting the uptake of green road transportation technologies (e.g. electric vehicles, compressed natural gas-/compressed biogas-powered vehicles and liquid biofuels blending). The goal was to develop information to guide effective policy, regulation and incentives to support the development of the green transport sector in South Africa. This would include fleshing out a roadmap towards the desired end-stated design, whilst also aligning with the Green Transport Strategy of the Department of Transport.

Despite several initiatives, the development of green transportation systems is still in its infancy in South Africa. For example, there are currently only around 300 electric vehicles in the country and some 40 public recharging stations. But some small steps forward have been made; e.g. the conversion of some mini-bus taxis to run on gas; and the development of an initial regulatory framework for biofuel production and blending - though its date of operation is yet to be determined.

Introducing change is often difficult, especially when it comes to innovative industries or sectors like green transport, where long-term investments have to be made. Whilst government can set appropriate policies, it is ultimately up to the private sector to buy into the large-scale uptake of green transport. From a regulatory perspective, a clear need to integrate policy and create a level playing field for green transport technologies vis-à-vis conventional technologies is apparent. Currently, only a limited number of incentives to promote green transportation are in place, and several gaps and/or areas of misalignment exist within the legislative framework.

Importantly, international experience shows that environmental concerns were at the time of implementation often not the primary driver of green transport strategies in most countries. Instead, job creation, energy security and the desire to reduce dependence on foreign oil, as well as lower foreign exchange expenditure seemed to provide important motivations for government action.

When it came to the environment, measures were often driven by concerns about local air quality rather than climate change per se. This is critical in the South African context. The development of sustainable transport systems would bring notable benefits: potential for new green industry sub-sectors; reduced transport costs and improved citizen mobility (especially reduced spatial disconnect for less privileged groups) – which would in itself have enormous potential spin-offs for access to employment and general economic development.

The key is to break through the so-called “chicken and egg dilemma”, whereby without the necessary supply and distribution infrastructure for green transport fuels in place, consumers will be reluctant to buy green vehicles, while without adequate levels of consumer demand, there is little or no incentive to invest in a local supply, distribution and production infrastructure. Government has a clear role to play in implementing measures aimed at creating a simultaneous push and pull to kick-start the market and allowing it to grow to a competitive and sustainable scale.

These dynamics would, in turn, enable the growth of a manufacturing industry. An adequate and integrated policy response would promote mobility, jobs and opportunity to the population overall, and reduce dependence on foreign fossil fuel supplies. While each individual measure may make a small contribution towards the end objective, taken together the policy package should generate enough support for viable uptake and a thriving green transport industry within the country.



Targeted outcomes and impacts

- A coherent package of policy measures, aligned with the current overall road transport policy framework.
- A shift of the framework away from the incumbents of the conventional diesel- and petrol-driven road transport industry, which would be a cornerstone for the development of new, greener alternatives.
- A level playing-field (or rather even a playing field preferential to emerging green transport technologies).

Key milestones

This Key Action Programme aims to work towards the establishment and implementation of a roadmap for the development of the green transport industry in South Africa.

2017/18 Q1-Q2: Establish a working group on the development of the green transport industry with terms of reference incorporating relevant stakeholders.

2017/18 Q3: Develop an actionable strategy for the development of the green transport industry in South Africa.

2017/18 Q3-Q4: Workshop the proposed strategy with relevant stakeholders and incorporate generated input into final strategy for approval.
Align with DoT to ensure policy coherence.

Lead Departments/Agencies: the dti, DoT, SANEDI, DoE

Supporting Departments: EDD, IDC, TIPS, DST, TIA

9. Water and Sanitation Outlook

(Chapter supplied by the Water Resources Commission)



Water is a critical input factor to industrial sectors like agriculture, agro-processing, forestry, manufacturing, energy production and mining. Citing the World Bank, Creamer Media (2016) has cautioned that some regions of the world, including Africa, could experience a decline in growth rates of as much as 6% as a result of water-related losses.

Not only does water underpin economic growth; leaders of the World Economic Forum (WEF) consider it a strategic sector in its own right. The WEF Global Risk Report has ranked water availability in the top three global risks for three consecutive years - 2015 to 2017 - highlighting the need to identify and implement intensive mitigation strategies.

In 2013, United Nations figures showed that more than 780 million people did not have access to improved sources of drinking water and 2.5 bn were without improved sanitation. Earlier Millennium Development Goals (MDG) financial projections of water and sanitation investment needs reported that the world would need to spend \$32 bn (ca. R430 bn) each year to meet sanitation goals by 2015.

Sub-Saharan Africa is one of the regions with the lowest sanitation coverage in the world: only 70%.²⁵ Almost 66% of the African continent is arid to semi-arid, with poor water infrastructure. The challenge of providing “traditional” centralised water infrastructure for most African countries is made more difficult and complex by the vast distances required to transport water, social inequalities, high unemployment, and fledgling water institutions without the capabilities to meet increasing demand.

On the other hand, Africa contains many of the fastest growing economies in the world – if, in many cases, off a comparatively low base and marked by highly uneven distribution - resulting in rapid urbanisation and a growing tendency for internal migrant populations to agglomerate in mega-cities.

In this context, recognition of the importance of investment in water - and the need to improve access and quality of drinking water and provide new sanitation solutions – is the necessary first step towards identifying and grasping the opportunities that a regionally shared industrial approach to water can provide.

Clear opportunities exist for the export of water technology solutions, knowledge and skills diffusion and the transfer of water-linked products like chemicals, industrial components, and ICT systems. The SADC Industrial Strategy (2015-2063) reports that “there will be no SADC industrial revolution without substantially higher investment in infrastructure, upgrading and diversifying the capital stock and the provision of the high technology skills necessary in the modern industry”. The Water and Energy sectors have the potential to be the spine of industrialisation strategies, particularly in view of the global water demand deriving from agriculture, power generation and manufacturing²⁶.

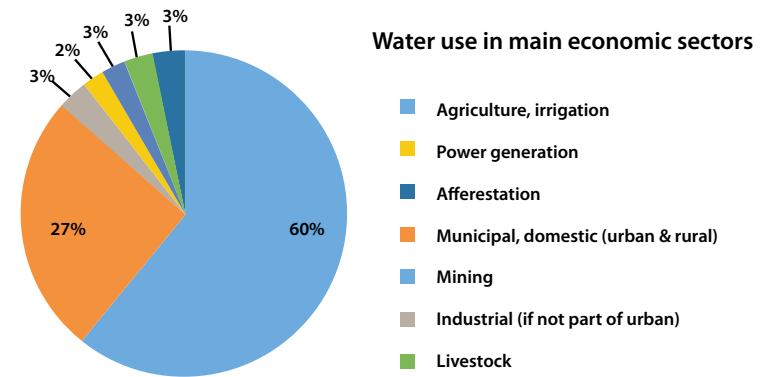
Water and Sanitation in South Africa

In South Africa, the water industry consists mainly of regulators, water boards, national agencies and other public entities that directly contributed approximately R6.4 bn or 0.4% to the country’s annual gross domestic product (GDP) in 2016. (The private sector’s involvement in water is in the main confined to the provision of supplies and professional services).

The situation is precarious: South Africa is ranked 148th out of 180 countries in terms of water availability per capita; in ecosystemic terms, it is further adversely affected by wide rainfall variations, erratic runoff, evaporation losses, shallow dam basins, siltation, pollution effects, deteriorating infrastructure, inefficient water use and high wastage. When considering these issues - coupled with rising population and economic growth projections - South Africa will by 2030 be demanding 17% more water than exists. The net deficit between supply and demand could grow to between 2.7 and 3.8 billion m3. (Water RDI, 2015).

This will have a significant impact on the rate at which strategic sectors - for example, those identified in the National Development Plan and IPAP - can grow and create the economic and social benefits expected. Below is an indication of water use across main economic sectors.

Figure 1: Sectoral water use in terms of the NWRSII (2012)



²⁵ Creamer Media Water Report, 2013

²⁶ UN World Water Development Report, 2015

A further complexity is that many of SA’s major industries are located inland where water quality effects are further exacerbated and 99% allocation implies that any additional growth requires allocation from existing sources or the generation of “new” water through alternate sources.

Water supply and water quality are interconnected. The increase in demand for water and the increase in supply also result in an increase in wastewater and pollutants.

The following key activities are recognised as affecting water quality:

1. Mining activity: acidity and increased metals content;
2. Urban development: salinity, nutrients (N and P); emerging contaminants in personal care and medical products; and microbiological;
3. Industries: chemicals (emerging pollutants like EDCs and pharmaceuticals) and toxins;
4. Agriculture: sediment, nutrients, agro-chemicals, and salinity through irrigation return flows.

Increasing activity and productivity in these sectors increases the cost of water treatment and leads to the degradation of catchments, negative impacts on health and hygiene and ultimately the rising overall cost of water to consumers and industry.

All these factors make it imperative to innovate as rapidly as possible and implement enhanced solutions for desalination, water reclamation, reuse and recycling.

The *South African Water Research, Development and Innovation Roadmap* - a partnership initiative between the Departments of Science and Technology and Water and Sanitation, hosted by the Water Research Commission (WRC) - recognises that only seriously targeted investment in key strategic areas of the water sector will drive long-term economic growth. In short, only by ensuring water security will the country have a chance to develop its competitive advantages, create and redistribute wealth and substantially improve the quality of life of the great majority of South Africans.

As per the National Water Act, access to safe drinking water and sanitation is a fundamental right which has a direct and indirect impact on the health, well-being, and safety of communities. Yet, approximately 55% of households lack access to piped water inside their dwellings (See Table 1).

While progress has been made in sanitation, it has been slow. Access to sewer service has only increased by 10% since 2001, and 40% of households in South Africa still have no access to a flush toilet.

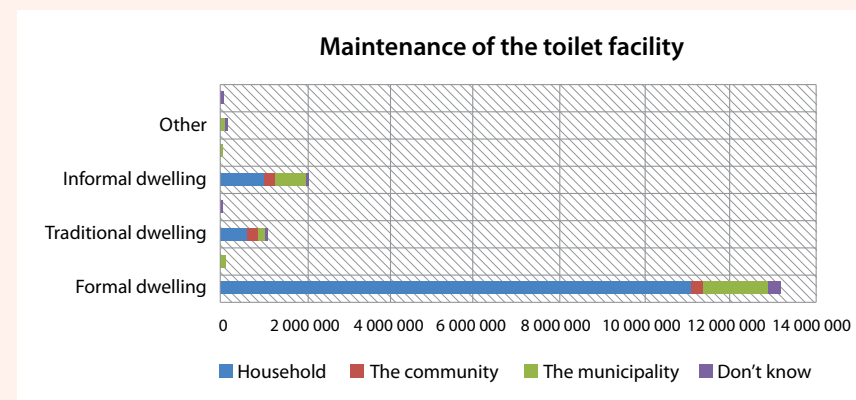
Since SA is a water-scarce country with limited opportunities for further dams, there is a need to rethink sanitation provision with more investment in off-grid, low water, or waterless sanitation solutions. The latter paradigm shift in sanitation provision can also generate jobs and business opportunities in communities.

Table 1: % Breakdown of Households with access to piped water in South Africa (StatsSA, 2016)

	Inside dwelling	Inside yard	Outside yard	No access to pipe
Census 1996	44.2	16.6	19.6	19.7
Census 2016	44.4	30.0	15.5	10.1

Table 2 shows that approximately 79% of South African households pay for their own maintenance, while 20.9% receive municipally subsidised O&M services. This suggests that in the long run the currently served markets with centralised sewers have the potential to shift to alternate technologies that are similarly serviced and paid for.

Table 2: Distribution of households by maintenance of toilet facilities and the type of main dwelling (StatsSA, 2016)



When considering socio-economic benefits, the NWRs II states that the water sector has a key role to play in terms of job creation. It is estimated that job creation can be increased in relation to water infrastructure development, functional water management and through water provision to key economic sectors such as agriculture, mining, industry and tourism, many of which are prioritised clusters and programmes within the IPAP.

Tables 3 and Table 4 indicate the potential for job creation based on Acid Mine Drainage projects and large hydropower projects across construction, operation and maintenance, and manufacturing (Green Jobs Report, 2011). The latter does not take into consideration the opportunities associated with conduit hydropower using pico, micro and small hydropower investments (WRC Research, 2015).

Table 3: Green Jobs Report (2011) Net direct employment associated with water treatment of Acid Mine Drainage (AMD)

Activity	Short term			Medium term			Long term		
	Domestic	Export related	Total	Domestic	Export related	Total	Domestic	Export related	Total
Construction	700	0	700	350	0	350	131	0	131
O&M	40	0	40	128	0	128	230	0	230
Manufacturing	0	0	0	0	0	0	0	0	0
Totals	740	0	740	478	0	478	361	0	361

Table 4: Green Jobs Report (2011) Net direct employment associated with large hydropower

Activity	Short term			Medium term			Long term		
	Domestic	Export related	Total	Domestic	Export related	Total	Domestic	Export related	Total
Construction	0	70	70	0	194	194	0	111	111
O&M	0	0	0	32	0	32	50	0	50
Manufacturing	0	148	148	0	566	566	0	111	111
Totals	0	218	218	32	760	792	50	222	272

A study conducted by the Pacific Institute on Water and Green Jobs (2013) identified 136 different kinds of jobs involved in implementing sustainable water strategies, from plumbers to landscapers, engineers to irrigation specialists.

Thirty-seven of these job types or occupations were also projected to have high growth in the overall US economy, with each projected to offer more than 100,000 job openings across industries by 2020.

Investment in water access, quality and availability has the potential to stimulate demand for alternate solutions and diversify the local market, enhancing the competitiveness and resilience of emerging black, women and youth based businesses.

Opportunities

Opportunities exist in both the water sector and sectors of co-dependence for advancing technologies that enhance water security through recycling, reuse and reclamation, and new reliable off-grid technology options for sanitation, water purification and energy.

- Developing a new sanitation manufacturing regional competence and SMME service development programme is feasible, particularly in view of the existence of a 40% unserved market, with 79% of those served currently paying for maintenance.
- The potential for responding to manufacturing needs related to water treatment and desalination parts and components is also a possibility, especially in the light of IPAP localisation and regional market development policies.
- In this regard, there are clear opportunities to develop strategic water-related manufacturing and localisation core areas such as pumps, pipes and turbines which will always be required to operate our vast water and sanitation networks. Twenty years ago, SA had a vibrant pump manufacturing industry, but this is now dominated by local subsidiaries of foreign multinationals; SA companies are mainly confined to servicing the mining sector. So, there is a clear and pressing need for the industry to rapidly increase its investment in R&D, new skills and improved products.
- An example of what can be achieved if energies are focused is the success of the current Department of Water and Sanitation (DWS) programme “War on Leaks”, which has led to the development of 15,000 newly-skilled artisans.

- The state clearly has an important role to play, since water is a public good; but many opportunities exist to design and roll out alternative delivery models where the private sector can play an important role without retarding social improvements.

This provides for the development of a functional triple-helix partnership between academia, public sector entities, the private sector, and their investors (Chetty and Luiz, 2014, Creamer Media, 2013).

- The water sector could certainly benefit from **dti** incentive schemes if they are structured towards considering public-private partnership (PPP) opportunities with water sector entities. Such incentives could potentially fall under the Manufacturing Competitiveness Enhancement Programme, the Manufacturing Investment Programme, The Cluster Development Programme and the Localisation Programme.
- The National Treasury allocated R10.5 bn in 2016 to complete 2,304 wastewater services projects over the current MTEF period. If linked to a clear industrialisation strategy and plan, these and other such projects have the potential to deliver several multiplier effects and contribute to substantial job creation.

Constraints

- Relatively conservative domestic markets for new-generation water technology and solutions;
- Traditional financing, management, planning and delivery models, which do not easily accommodate to paradigm shifts in the provision of water security;
- Inadequate financing: this will remain a key challenge in the South African water sector. The funding gap outside the budgetary allocations over a 10-year period is expected to be R338-bn (DWS, 2015).
- Lack of manufacturing capability to service growth in new sanitation and water treatment markets;
- Water is locked in a constant, often losing, resource-allocation battle with other competing demands upon the Treasury - perhaps an indication that it is not yet fully regarded as a critical industry in its own right.

Key Action Programmes

1. Water Industrialisation Development Plan

Nature and Purpose of the intervention

The industrialised water sector is still in its infancy, both in South Africa and the region, with recent debates having highlighted the need to fundamentally reconsider water's crucial role in industrialisation on the continent.

The problem, however, is that at the moment there is no framework to direct investment into this area. This Plan, therefore, aims to greatly upgrade our understanding of the interaction between integrated water resource management and industrial development, providing a pathway towards integrated water management and sustainable industrialisation. It will enable South Africa to build on quick wins and ensure a more viable industrialised water sector, focussing on the creation of alternative economic sectors and their development through strategic stakeholder alliances.

Targeted Outcome

A focused plan and pragmatic framework for the development and growth of the industrialisation of water and the realisation of its related socio-economic opportunities over the long-term.

Key Milestones

2017/2018 Q3: Memorandum of Understanding with private companies and public sector partners for collaboration towards co-developing and implementing the Water Industrialisation Development Plan.

2018/2019 Q2: Develop the Water Industrialisation Plan and Framework.

2019/2020 Q1: Begin implementation of the key actions and recommendations of the Plan.

Lead Departments: dti, DST, DWS, COGTA

Supporting agencies: EDD, DED, WRC, TIA, IDC, Department of Human Settlements, SALGA, SETAs

2. Innovative Desalination and Water Manufacturing Programme

Nature and Purpose of the intervention

It is very important to develop local manufacturing capability and competitiveness to service the public and industrial sectors in their efforts to implement effective water reclamation and reuse solutions. This will drive local market independence for a strategic sector, with regional export potential.

- Creating a more streamlined innovation and technology deployment of desalination and appropriate water technologies that enables the uptake of viable water sector solutions into industry and business.
- Stimulating innovation and ensuring capability development for effective diffusion of technologies at competitive prices.
- Developing robust and competitive SMMEs specialising in technologies, membranes and essential components to service SA and African markets.

Targeted Outcomes

- More emerging technology demonstrations as part of de-risking new innovations.
- Transfer of technology.
- Upgraded capabilities (reskilling and new skills).
- Increased number of investment partners through match-making.
- Procurement, pricing and policy incentives for improved uptake.

Key Milestones

- 2017/2018 Q2: Strategic Assessment on the key desalination technology opportunities (manufacturing components; new membrane development, policy and procurement incentives, new skills build)
- 2017/2018 Q3: 5-year implementation plan for desalination solutions for rural and urban needs, with application to drinking water, sanitation and industrial wastewater.
- 2018/2019 Q2: Sustainable testing facilities for new product development, identifying knowledge gaps and opportunities.
- 2018/2019 Q2: Assessment of strategic components manufacturing opportunities linked to water infrastructure and technologies such as pumps, turbines and pipes; with opportunities for localisation.

2018/2019 Q3: Partner with Water Technologies Demonstration Programme (WADER) to accelerate diffusion of technologies to water sector partners (tech assessments and demo-diffusion pipeline).

Lead Departments: dti, DST, DWS, Associated Water Entities and Municipalities

Supporting Agencies: TIA, WRC, TCTA, SALGA, Mining sector and key industry players

3. Next Generation Sanitation Cluster Development Programme

Nature and Purpose of the intervention

Development of off-grid sanitation technologies will lower water requirements for sanitation, enabling reallocation to alternative needs and economic sectors and more effective service delivery in rural, peri-urban and water-scarce areas. An off-grid sanitation market presents an expansion opportunity for manufacturing, service and supply sectors.

- Expand sanitation industry to service the unserved 40% households and diversify the market with new products.
- Increase water availability for social and economic needs using efficient technologies.
- Unlock new private sector delivery mechanism for sanitation services.

Targeted Outcomes

- The establishment of the next generation sanitation CDP.
- Development of emerging industry capable to develop new technology, within the framework of localisation.
- Procurement and policy incentives for improved uptake.
- Development of high-end skills for advanced thermal sanitation technologies and artisanal skills for operation and maintenance.
- 20 SMMEs per annum post-implementation.
- Potential 15,000 jobs at 20% market penetration for the currently unserved.

Key Milestones

- 2017/2018 Q2: Strategic Assessment on next generation sanitation technology opportunities (manufacturing components; new technology development, policy and procurement incentives, new skills build).
- 2017/2018 Q3: MoU with private, public and academic partners to co-develop and support the implementation of next generation technologies.
- 2017/2018 Q4: 5-year implementation plan for sanitation solutions.
- 2018/2019 Q3: New product development, testing and manufacturing hub.
- 2018/2019 Q4: Embed technology assessment and emerging technology demonstration within CDP hub.
- 2019/2020 Q2: Economic baselines established.

Lead Departments: dti, DST, DWS and associated Water Entities and Municipalities

Supporting agencies: EDD, TIA, WRC, TCTA, SALGA, mining sector and key industry players

4. Modular and Advanced Wastewater Technologies Manufacturing and Capability Build Programme

Nature and Purpose of the intervention

Water supply and water quality are interconnected. The increase in demand for water and the increase in supply also results in an increase in wastewater and pollutants. This has an impact on cost to industry for water treatment, but presents an opportunity for water technology provision and services. An advanced wastewater manufacturing and capability build programme has the potential to decrease technology cost, enhance competitiveness through new solutions and develop and position South African businesses for increased export opportunities.

- Develop advanced technology competitiveness.
- Stimulate innovation and ensure capability development for bulk, advanced and modular technologies for industrial and public markets.
- Develop robust and competitive SMMEs specialising in appropriate technologies for SA and African markets.

Targeted Outcome

- More emerging technology demonstrations as part of de-risking new innovations.
- Transfer of technology.
- Upgraded capabilities (reskilling and new skills).
- Increased investment partners and match-making.
- Improved uptake through procurement incentives.
- Inclusion of more women, black and youth enterprises.

Key Milestones

- 2017/2018 Q3: Wastewater technologies strategic assessment in terms of technology options, rollout capability and demographic spread.
- 2018/2019 Q1: Develop and roll out a skills build and technology offering programme to enhance competitiveness amongst black, youth and women based SMMEs.
- 2018/2019 Q3: Develop sustainable testing facilities for new product development, identifying knowledge gaps and opportunities.
- 2019/2020 Q1: Partner with Water Technologies Demonstration Programme (WADER) to accelerate technology diffusion to water sector partners (tech assessments and demo-diffusion pipeline)

Lead Departments: dti, DST, DWS and associated Water Entities and Municipalities

Supporting agencies: EDD, TIA, WRC, TCTA, SALGA, AGRI, Mining, Power and Tourism industries

10. Business Process Services

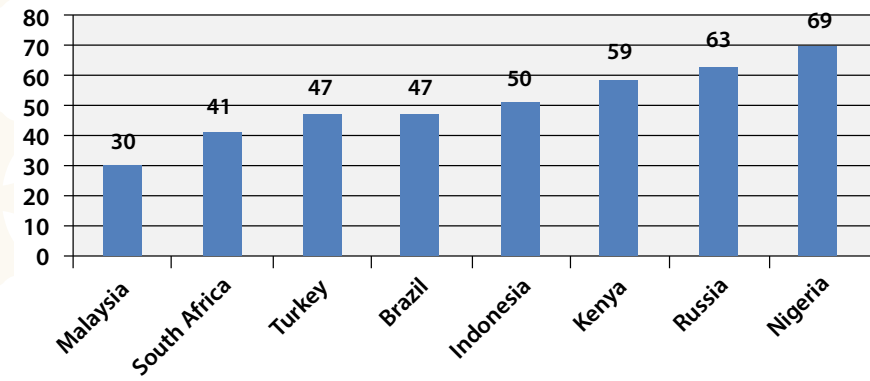
Situational analysis

In today's offshoring environment, global companies are still pursuing cost savings with the adoption and use of IT innovations. The significant economic advantages and benefits of arbitrage are considered an ultimate goal; hence global offshoring business operations in lower-cost developing economies continue to be extremely competitive.



The business concept, 'offshoring operations', is largely driven by decreasing telecommunications costs, greater bandwidth connectivity and the increased need for large-scale IT operations. When leaders of business use the competitive comparison tool, considering these key factors, South Africa stands out as an attractive environment compared to most of its peers, notwithstanding the global economic downturn and a shaky environment in the European Union and UK economies.

Figure 1: Country Competitiveness Comparison



Source: McKinsey Global Institute: 2015 Overall risk, January 2015 (Lower score = less risk)

Although the United Kingdom is the traditional 'anchor' market, the USA, the EU, Australia and the Philippines are increasingly viewing South Africa as a preferred offshore location, as part of their attempts to leverage cost differentials and implement business risk mitigation strategies. Other than the factors considered by companies in investment decisions, South Africa's Value Proposition would not be a strong one if it were not for the dti's BPS Incentive. This has attracted more than 40 multinationals to our shores, securing investments of over R34 bn and creating over 30,000 jobs.

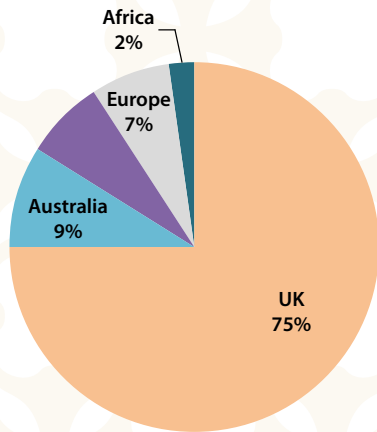
At a provincial level, several initiatives are being implemented by government and the private sector. In addition, cities such as Durban and Port Elizabeth have become increasingly preferred locations, given their proximity to Coega and Dube Trade Port. There is also interest in BPS development in tier-2 towns such as Hammanskraal.

In the global context, Brexit has caused some uncertainty due to the dual status (UK vs Rest of Europe) of clients of most investors. Despite this uncertainty, however, the McKinsey Global Institute Report (2015) reveals that South Africa now accounts for an estimated 1% of the global market. The industry offers the country's largest job creation potential across the service sectors. Furthermore, based on benchmarking with other BPO hubs, MGI estimates that South Africa could quadruple its global market share to 4% by 2030, adding approximately R100 bn to GDP and creating a further estimated 190,000 jobs.

Key Economic Data

About 390,000 Full Time Equivalents (FTEs) spread amongst Gauteng, Western Cape, KZN and Port Elizabeth were employed by the BPS industry in South Africa in 2016. At least 30,000 of these are from companies conducting offshore business (and therefore supported by the BPS incentive). The industry realised a 26% growth between 2011 and 2016.

Figure 2. South Africa's BPS source markets



Source: BPeSA Industry Indicator Report 2015

A new development is the emergence of Africa as a destination for Shared Services Centres by firms based in this country. Several companies in the telecoms and asset management sectors have already qualified for the BPS incentive based on their shared services operations, which are servicing their branches across the continent.

Business Process Outsourcing (BPO) capabilities are evolving to include highly specialised industry services, and South Africa is attracting new investments because of its growing infrastructure, skilled workforce and cultural affinity with the global English-speaking market.

Table 1: Contribution of the dti's BPS Programmes to Employment and Export Revenue

Program	Variable	Contribution 2007-2010	Contribution 2011-2014	Contribution 2015- 2016
BPS Incentive	Employment	9,295 (BPO&O)	9,077 (BPS)	13 857
MWRP*	Trained	4, 467	9, 356	3,422
MWRP	Employment	3, 483	7, 268	2,622
BPS Incentive	Export Revenue	R349m	R5,9bn (project- ed)	R12,003,825,090 (Projected over 5 years)

* Monyetla Work Readiness Programme
Source: the dti

The sector is expected to continue growing over the next five years as more international companies realise the quality of work delivered in the South African sector, associated cost savings, the ability to deliver complex processes and government support in the form of incentives and investment promotion.

CASE STUDY:

EXL Opens new customer support centre

EXL, a Nasdaq-listed business process solutions company, celebrated the opening of its new call centre in Cape Town on the 24 November 2015, servicing US clients on analytics and business transformation assistance. The operation launched with 60 new jobs; and there are ambitious plans to create up to 6,000 new jobs within the next three years. The establishment of the EXL delivery centre follows the company's evaluation of locations in Central Europe, Asia and Latin America.

EXL's Customer Support Centre in the Portside Towers



Source: Cape Business News

The centre will support all regions that have customer relationships or processes conducted in English, particularly relevant to companies in the UK and Europe given cultural similarity and time zone advantages. The facility is also able to support organisations with customers in South Africa.

EXL is a US-owned Operations Management service provider with global clients in analytics and business transformation assistance. It offers technology platforms to a wide range of industries including insurance, healthcare, banking and financial services, utilities, travel, transportation and logistics. In 2015 Forbes recognised EXL as one of the 100 most trustworthy companies in the US. The company employs 24,000 professionals who service 750+ clients in 25 languages from 35 global locations in the Americas, Europe, India, Asia, Colombia and SA.

Progress Highlights

Some recent highlights include the following:

- The Global Country Competitiveness Report by the London School of Economics ranked South Africa 2nd overall in 2015.
- South Africa secured 2 projects responsible for 688 jobs in an emerging subsector on tutor services provided in conversational English from South Africa to learners in Asia via online face-to-face platforms.

Key Opportunities

- South Africa is Africa's most diversified economy, with a sophisticated services sector that accounts for some 62% of GDP.
- Sharing a similar culture to that of the English-speaking markets provides an opportunity to capture more of the global market share in the front office, voice-based vertical, growing increasing interest from countries like Australia and New Zealand.
- The emergence of the Global Delivery Model concept provides an opportunity to sell better quality, shorter call-resolution turnaround times and world class infrastructure to those operators based in tier-1 destinations who are considering relocating or expanding.

Key Constraints

- A shortage of skills at middle management level.
- Increasing competition by other offshore locations, especially ones in Africa.
- The slow pace of industry transformation in compliance with BB-BEE Act; and
- Uneven development of industry association(s).

Key Action Programmes

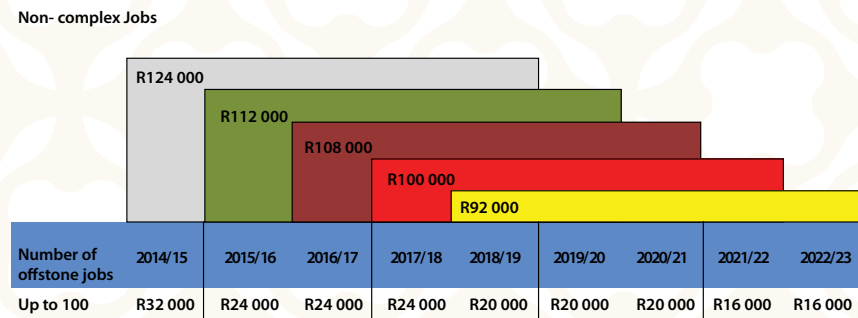
1. Implementation of the BPS incentive

Nature and Purpose of the Intervention

Following on from a thorough review conducted in 2014, a new graded scheme has been introduced, which will last over a period of five years. The purpose of the new scheme is to sustain the strong growth momentum of the voice-centric element of the BPS industry, with a particular view towards enabling job creation for unemployed youth.

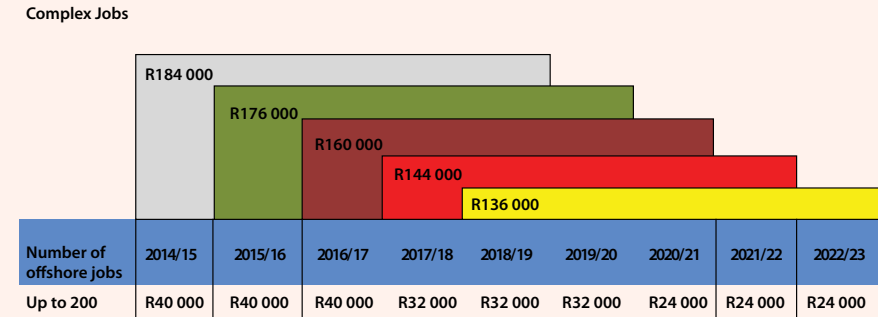
The redesigned incentive will also help to improve South Africa’s competitiveness as a BPS location for higher value jobs, thus moving it up in the value chain in emerging areas such as marketing BPS, legal process outsourcing, social media, analytics, and banking financial services and insurance BPS. A new addition to the incentive is a distinction between complex and non-complex jobs.

Figure 3: Non-complex jobs calculation



Source: the dti Incentive Administration

Figure 4: Complex Jobs Calculation



Source: the dti Incentive Administration

A once-off bonus incentive is offered for greater job creation, if the applicant exceeded annual offshore job creation targets.

Targeted outcomes

The new guidelines will increase financial benefit for companies planning to set up or grow in South Africa. The incentive will help reduce operating costs for companies by 11-12% - thereby reducing the cost gap between SA and its competitors – and is expected to result in the creation of approximately 18,000 new jobs by 2019.

Key milestones

2017/18 Q1-Q4: Ongoing Implementation of the BPS incentive.

Lead departments/agencies: the dti

Supporting departments / agencies: EDD, NT

2. Talent Development for the BPS sector

Nature and Purpose of the Intervention

A scalable pool of skilled English language talent is South Africa's core strength. Similarities in the country's domestic industry with source markets in terms of products and services give agents the ability to connect naturally with customers.



Monyetla Work Readiness Programme 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 6,000 unemployed youth from across the country to gain work experience in this industry and other sectors of the economy.

Key milestones

- 2017/18 Q2-Q4: Training of 6,000 unemployed youth at NQF level 4 and above takes place.
- 2017/18 Q4: 966 unemployed youth recruited from tier-2 and tier-3 towns, townships and rural areas are contracted into employment.
- 2017/18 Q4: 4,200 trained learners contracted into employment for a minimum 12-month contract.
- 2016/17 Q4: Curriculum review and Impact assessment completed (with tracking tool).

Lead departments/agencies: the dti

Supporting departments / agencies: EDD, NT, DHET

11. Marine Manufacturing & Associated Services Industry

Situational analysis



The South African marine manufacturing industry includes the manufacturing of vessels (boat and ship) sub-sector and the maintenance and repair of ships, boats and rigs. The purposes of locally manufactured vessels vary widely, from commercial, working and transportation vessels to various kinds of leisure craft.

The ship/boatbuilding sector in South Africa and globally displays some key differentiating features in comparison to other manufacturing sectors. In terms of production, the manufacturing of a ship or boatbuilding takes place over an extended time period (long production timing) for a one-unit output (lower volume of production) and at high production cost (high unit values). The time span is even longer for larger boats and ships: up to a year or longer for a typical large vessel.

The setup of a production process is generally project-based rather than mass production. The long production timescales required to complete projects mean that manufacturers deal with long cash-flow cycles. The requirement for availability of such working capital at the initial stage of a project constitutes a high barrier to entry; and the long production cycle exposes manufacturers to changes in inputs costs driven by inflation or exchange rate fluctuation, while the final price of the product (vessel) is fixed upfront.

Table 1 below sets out the principal components and services in the value chain.

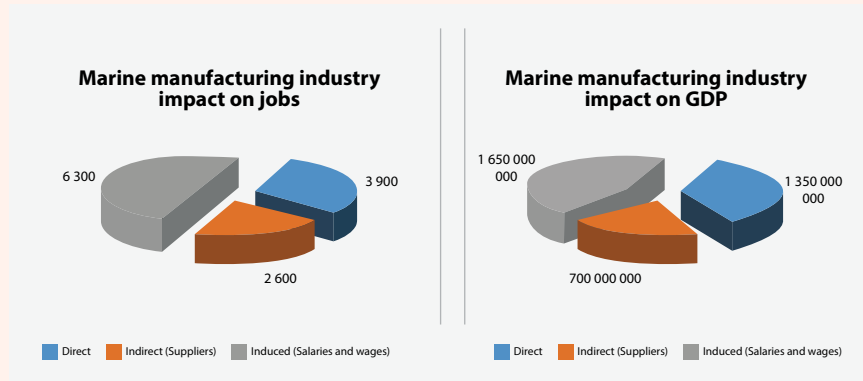
Table 1: Principal Components and Services in the Value Chain

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"> • Auxiliary Engines (Diesel) • Auxiliary 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
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 	

Source: Balance Technology Consulting et al, 2009

The performance of the marine manufacturing industry is reflected below in Figure 1, with 3,900 direct, 2,600 indirect and 6,300 induced jobs. The direct contribution to GDP is estimated at R 1.35 bn - R 0.7 billion indirect and R1.65 billion induced.

Figure 1. Marine manufacturing contribution to GDP



Source: Urban Econ (MIASA, 2015)

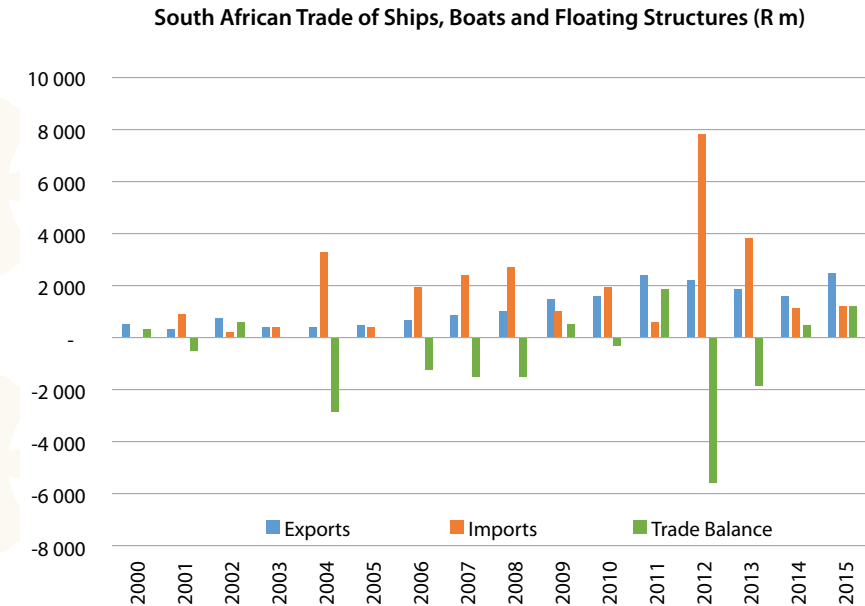
Table 2: Overall sector economic trade performance

Year	Performance in 2014	Performance in 2015 % Change	% Change
Exports	1,486,027,607	2,386,940,157	61%
Imports	1,069,097,194	1,187,773,361	11%
Trade Balance	416,930,413	1,199,166,796	188%

Although the ship/boat building industry has not fully recovered from the 2008 financial crisis, the marine manufacturing sector has experienced a positive export growth outlook, with the exception of 2012 and 2013.

Exports increase from R1.49 bn in 2014 to R2.39 bn in 2015 (60% growth), while imports increased by 11% from 2014 to 2015. Thus, the trade balance remains positive. The exhibits below (Table 2 and Figure 2) illustrate the industry's recent and longer-term performance since 2000.

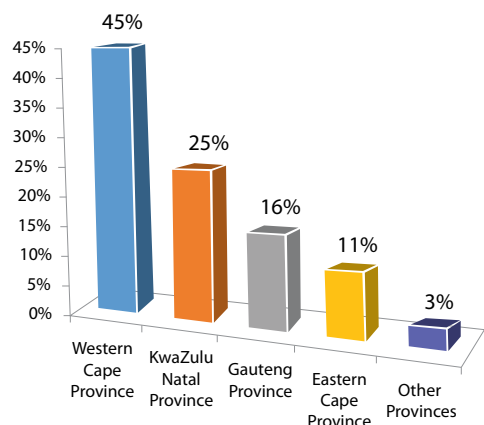
Figure 2. Trade data of commercial vessels



Source: dti Calculation on SARS Data

The marine manufacturing industry remains dominant in the coastal regions of South Africa. However, Gauteng province has a number of players who specialise in the smaller racing and motor boats. The Western Cape Province represents the largest share of marine manufacturing in South Africa, generating over R1 bn in export revenue, and housing approximately 70% of SA's boat builders - including two of the big shipbuilders.

Figure 3: Location of the Total Boat Manufacturing Companies (%)



Source: Urban Econ (MIASA, 2015)

Analysis of the current performance of the South African marine manufacturing and associated services industry shows up the following major opportunities and constraints for sector:

Key opportunities

- Opportunities to expand exports in non-traditional markets driven by industrial and tourism development in emerging markets, particularly including sub-Saharan Africa and the Middle East.
- Substantial growth opportunities in the commercial boat market, particularly including sub-Saharan Africa, with an emphasis on offshore speed craft, ferries, water ambulances and working boats.
- Opportunities to develop training, repair and maintenance operations in sub-Saharan Africa.
- Greater intergovernmental collaboration with African countries and facilitation of expanded trade, e.g. through funding assistance.
- Opportunities to increase innovation through collaboration between industry and research organisations to improve the competitiveness of the industry in terms of international standards.
- The development of sector-specific training and skills improvement programmes.

Key constraints

- A volatile Rand, which raises costs of imported items.
- Lack of infrastructure.
- Decreasing support of the local supplier network; fewer than 60 percent of these businesses have been operational for 20 years or more.
- Lack of diversification in the local supplier network, which is overly-dependent on the marine and maritime sector.
- Skills development inadequacy.
- Decline in marine-related industries in key nodes.
- Fragmentation and lack collaboration within the industry.
- Manufacturing competitiveness is further impacted by:
 - High overhead costs;
 - Fluctuations in the cost of raw materials;
 - Increase in technical or non-tariff barriers in international markets;
 - Limited reinvestment in product innovation.

Progress to date

The dti has made significant progress in the following areas:

- Designated the industry for local procurement at 60% local content level; SOCs are starting to embed local content requirements in their Request for Proposals (RFPs).
- Developed a long-term procurement plan to ensure that demand is known in advance so that industry can gear itself appropriately.
- Commissioned a value chain study (focus on component manufacturing) which will inform the future amendment of the Working Vessel Instruction Note.
- Developed a Customised Sector Programme which will guide the development of interventions going forward.
- Developed a skills development programme working with the industry.
- Currently working on a certification/accreditation support programme through NIPP.

Key Action Programmes

1. Designation and Localisation Programme

Nature and purpose of the intervention

Growth and volume of employment in the marine manufacturing industry remain order book-dependent, with global competitors supplying a large portion of the local market - including government requirements for vessels. Between 1994 and 2014, a total of R19 bn was spent on the acquisition of vessels for the public sector. Of these acquisitions, only R 900 million was allocated to the procurement of locally manufactured vessels and the rest (or 95%) of these vessels were imported. A vessel life span 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.

This programme is aimed at leveraging public procurement of working vessels to resuscitate marine manufacturing and its entire value chain, with the ultimate goal of increasing domestic demand and rebuilding domestic capabilities, including in maintenance, repair and overhaul (MRO).

Targeted outcome

Increased competitiveness, capacity and capability of the local industry and its increased contribution to GDP and employment.

Key milestones

2017/18 Q1 – Q3: Review and finalisation of the instruction note and amendment of the existing instruction note.

Lead department/agencies: the dti

Supporting department/agencies: EDD, SABS, Lloyds, Bureau VERITAS, SAMSA, MIASA, eThekweni Maritime Cluster, Industry, DHET, DST, NT

2. Components Supplier Development Programme

Nature and purpose of the intervention

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. Nevertheless, 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 in partnership with government to support, nurture and develop SMEs within the partner's supply chain or sector to become manufacturers of goods and suppliers of services in a sustainable manner.

Targeted outcome

Developed supply chain capabilities and capacity in support of the core builders and a locally and globally competitive components manufacturing sector.

Key milestones

2017/18 Q1 – Q3: Investigate the private sector's procurement and sourcing patterns to determine value and extent of imported components in the value chain and develop a component supplier development programme working closely with the core builders.

2017/18 Q1 – Q4: Working closely with NIPP to develop a support mechanism for accreditation and certification for component manufacturers and matching potential manufacturers with obligors.

Lead department/agencies: the dti

Supporting department/agencies: EDD, SABS, Lloyds, Bureau VERITAS, SAMSA, MIASA, eThekweni Maritime Cluster, Industry, DHET, DST, NT

3. Skills Development Programme: Competitiveness Improvement Initiative with focus on Skills

Nature and purpose of the intervention

South Africa is faced not only with a shortage of high levels of skilled people, ageing workforce which needs urgent rejuvenation, but also with a shortage in the lower skills levels needed for the support of its growth and competitiveness in the local and global market. The importance of this industry is closely linked to the labour-intensive characteristic of the sector, and its ramifications for the wider economy, via the importance of employment multipliers.

Operation Phakisa, based on the Malaysian, “Big Fast Results” model, highlighted the skills and capacity challenges the marine industry faces, including insufficient workplace-based training and training institutions not positioned to supply skills for the growth of the industry.

Targeted outcome

A large pool of skilled workers, thus expanding the knowledge base and improving the competitiveness of the industry.

Key milestones

2017/18 Q1 – Q4: Roll out the skills development pilot programme in conjunction with the industry and identified training institutions.

Lead department/agencies: the dti, DHET

Supporting department/agencies: EDD, SAMSA, MIASA, eThekweni Maritime Cluster, Industry, DST, NT

CASE STUDY: DORMAC

DORMAC is an engineering concern that carries out the business of marine engineering for both the ship repair and oil rig repair industries. The company is well positioned along the eastern and western coast of Southern Africa, with facilities in Richards Bay, Durban, Cape Town, Saldanha and Walvis Bay.

Within the Port of Durban, Dormac is located in its own shipyard, developed on land belonging to Transnet. The Port of Durban is the busiest port in Africa with the highest volume of vessel traffic and cargo movement. Dormac is the largest ship repair operator in the Port of Durban and recently won the “Best Ship Repairer” award from Transnet National Port Authority.



The floating dock in Durban

Dormac’s facilities in the Port of Cape Town include a deep-water repair quay with harbour-side workshops and large fabrication workshops adjacent to the Port. The Cape Town and Saldanha Bay operations specialise in large-project oil and gas repair work. (Oil rigs).

In June 2015 Dormac submitted a 12i application to **the dti** to benefit from the Department’s Industrial Development Projects to acquire and operate a new floating dry-dock in the port of Durban. The project included the purchase of the dock as well as the construction of a purpose-built quay to house the dock and operate in 13m deep water. The project value was R291 million, to be financed by banks and shareholders. The 12i tax allowance made it possible for the company to secure the loans and investment.

12. AEROSPACE AND DEFENCE

Situational Analysis

The term “aerospace industry” refers to a cluster of private and public entities that researches, designs, manufactures, operates, maintains and controls vehicles moving through air and space. Given the increased overlap between products intended for defence and civilian use, both nationally and internationally, the aerospace industry also includes those which produce defence equipment or products by making use of civilian technologies, or which manufacture dual-use products, which can be sold in both defence and non-defence markets.



As defined in the Defence Review, the term Defence Industry refers to companies (both public and private) that are primarily concerned with the design, development, manufacture, production or support of weapons, munitions, pyrotechnics, equipment systems and other matériel for the Defence Force or for export; divisions of companies in other sectors that are so engaged; and companies that are major sub-contractors or component suppliers to such activities.

An active and flourishing aerospace and industry is one with critical and pervasive generators of new cutting-edge technologies that will not only drive innovation in aeronautics and space, but through dissemination into other sectors (spillover effects).

Recognising this importance, government has, over a decade, been active in its support - through a wide range of complementary mechanisms such as the NIPP and DIP - and has assigned certain roles to various departments (**the dti**, DPE, DST, DoD)

whilst also establishing important industry initiatives like AISI²⁷, CAV²⁸ and JASC²⁹ to ensure adequate growth takes place within the industry.

The South African Aerospace and Defence industry has successfully entered the global market through its exports, global partnerships with many of the world’s leading aerospace original equipment manufacturers (OEMs), such as Airbus and Boeing, and integration into global supply chains. The aerospace and defence industry showed an export propensity of between 60% to 64% from 2010 to 2015. Its innovation index stood at 0.71 in 2015, whilst the total workforce employed by the industry stood at 13,590.

The innovation index tracks both the industry’s capacity to create new products and processes and its ability to compete successfully in the global market.

Table 1. Defence sector- Economic Indicators, Source: AMD

YEAR	2010 R`000 000	2011 R`000 000	2012 R`000 000	2013 R`000 000	2014 R`000 000	2015 R`000 000
Sales (local)	5 000	5 000	6 390	5 990	6 230	7 300
Sales (export)	9 000	9 000	10 300	10 300	9 520	11 710
Sales (total)	14 000	14 000	16 690	16 290	15 750	19 010
R & D	1 250	1 350	1 480	1 410	1 710	1 760
Employment	12300	11600	11600	11 600	12 280	13 590
Sales/ employee	1.14	1.21	1.44	1.40	1.28	1.40
Export Propensity	0.64	0.64	0.62	0.63	0.60	0.62
Innovation index	.73	.74	.70	.72	.71	.71

²⁷ Aerospace Industry Support Initiative

²⁸ Centurion Aerospace Village

²⁹ Joint Aerospace Steering Committee

Key opportunities

Key opportunities are likely to continue to be in the export market, mainly with the global OEMs. The globalisation of supply chains and current market conditions require that the SA Government and the SA aerospace companies cooperate ever more closely to maintain and expand their share of this important part of the advanced engineering sector.

Challenges

The sector faces challenges such as: economies of scale; nature of defence business (G2G and OEM/product system-level export vs SMME/components and sub-system level); delays in defence procurement; barriers to entry in the aerospace market.

CASE STUDY: Ti-TAMED

Ti-TAMED is an SME manufacturing company established in 1996. It specialises in high-precision engineering with materials such as titanium, stainless steel, invar (a nickel-iron alloy), nitronic, aluminium and high performance polymers.



Under **the dti** supplier development scheme, administered by AISI, Ti-TAMED served as a development partner with Aerosud Aviation on specialised part manufacture. This led to an increased business volume and subsequent development of Ti-TAMED as an aerospace supplier.

Aerosud Aviation assisted the company to increase its business opportunities through both technology transfer and improved throughput. Further interactions with Ti-TAMED are in process improvement and the transfer of machining best practices, as well as an improved and reduced coordinate measuring machine (CMM) process, which will create the required capacity for further growth.

The SMME has been able to manufacture some critical components which allow other companies in South Africa to assemble and export technology. The introduction of geometric dimensioning and tolerancing (GD&T) CMM processes by Aerosud Aviation has further improved CMM capability and throughput.

To date, the company has manufactured approximately 181 different parts for Aerosud Aviation – from turning to milling. On the more complex parts, 5-axis CMM measuring was provided.



Ti-TAMED

Key Action Programmes

1. Establishment of the Bilateral Air Service Agreements (BASA)

Nature and purpose of the intervention

A number of South African companies manufacture products and offer services to the international aerospace market, most notably the European Union and the USA as the major trading partners. South African manufactured products are required to have Federal Aviation Authority (FAA, USA) and European Aviation Safety Authority (EASA, EU) accreditation. This is costly and most SA companies are unable to afford the costs required to get the necessary certifications and approvals for the export of their products into the US and EU markets.

Below is a practical example of challenges faced by the South African Industry in Exporting its products to the US and EU.

Jonker Sailplanes (YS) manufacture gliders in Potchefstroom. Their product is very sought-after by the champions of the glider fraternity due to its excellent flight characteristics. This has been achieved through the strong relationship they have built up over the years with the University of Potchefstroom's engineering department and with support from government. The gliders are mostly used by overseas competitors in International Championships.

The problem arises with servicing overheads on these gliders. The process is very costly: SA companies have to do their servicing in line with our CAA regulations because there are no bilateral aviation safety agreements in place. This puts Jonker sailplanes at a distinct competitive disadvantage. The only way for them to become equally competitive in the market at this stage would be to sell their Intellectual Property (IP) to an overseas company, have it registered under that company's name and get it certified by EASA and/or FAA. Jonker Sailplanes has recently sold its 100th glider - 80 of which are operational in Europe - but could perform far better if the necessary bilateral agreements were in place. This is not an isolated case; many other companies that are affected in the same way.

Targeted outcomes

- A more competitive environment for the aerospace industry.
- Better integration into global supply chains.
- Increased exports.

Key milestones

2017/2018: Q1: Establishment of the project plan.

2017/2018: Q3: Establishment of the BASA with FAA.

2017/2018: Q4: Admission of a product for type certification.

Lead departments/agencies – Department of Transport, **the dti**, South African Civil Aviation Authority, AISI,

Supporting Departments/Agencies: EDD, DST, CSIR

2. Enabling High Value Manufacturing through Technology Enhancement for the Aerospace Industry

Nature and Purpose of the intervention

Intense global competition has seen many manufacturers become inventors and innovators in order to increase their productivity and competitiveness. High-tech industries like aerospace are rapidly moving away from traditional production methods and towards more modernised technologies to ensure their continued growth and sustainability.

Technology enhancement is targeted on high-impact areas for industrial growth in the aerospace sector. This has direct benefits for both SMMEs and OEMs. The first of the two key high-impact areas is technology transfer, through which OEMs can enhance the development and growth of SMMEs by the introduction of new manufacturing processes or techniques, product differentiation, knowledge diffusion and skills development.

The second high-impact area focuses on technology validation. This promotes collaboration within the aerospace industry as OEMs use SMMEs, science councils and other national infrastructure to validate the technologies being developed. It also promotes new areas of collaboration and growth between industry players and has significant wider economic spin-offs as technologies are prioritised within the OEMs and SMMEs to the benefit of the aerospace sector as a whole.

Targeted Outcomes

- Increased high-value manufacturing through technology enhancement across the aerospace industry.
- Increased competitiveness of aerospace SMMEs, enabling them to increasingly integrate into international supply chains and compete globally.
- Industry transformation and diversification.

Key Milestones

2017/2018: Q1: Identify OEMs and SMMEs with potential for high-value manufacturing in the aerospace and defence industry through technology enhancement and enabling projects that promote new advanced manufacturing techniques processes.

2017/2018: Q3: Implement technology transfers.

2018/2019: Q4: Review and evaluate impact of technology enhancement within the aerospace industry, focussing on aerospace SMME growth and economic impact.

Leading Departments/ Agencies: the dti, Department of Defence, Aerospace Industry Support Initiative (AISI), CSIR.

Supporting Departments/Agencies: EDD, DST, TLIU, Other government departments, Science councils, Universities and Industry

3. Development of an industry charter for the South African Defence Industry (SADI)

Nature and Purpose of the intervention:

The Objectives of the Charter are to provide the SADI with a framework within which to implement BB-BEE and give practical effect to national policy imperatives as set out in The National Development Plan (Vision 2030), the Defence Industrial Participation Programme, the National Industrial Policy Framework, the Industrial Policy Action Plan, the Black Industrialists Programme and the South African Defence Review 2014.

The charter aims to increase the number of black people who manage, own and control enterprises and productive assets within the South African Defence Industry. It will also seek to achieve an equitable representation in all occupational categories and levels in the workforce and provide additional skills to black employees at all levels within the industry.

Further interventions are necessary to facilitate ownership and management of enterprises and productive assets by communities, workers, co-operatives and other collective enterprises

The purposes of the intervention are to:

- Implement measures that will ensure the effective participation of Black people in SADI;
- Encourage the participation and growth of SMMEs in SADI;
- Promote the growth of technical innovation within SADI;
- Promote the growth of SADI as a profitable, sustainable industry;
- Promote local manufacturing capability in the SADI for local and export purposes;
- Advance the acquisition, retention and transfer of critical, technical/scarcely skills in SADI; and
- Protect IP of a sovereign and strategic nature in the SADI.

Targeted Outcomes

- Increased localisation and stimulation of indigenous technology and products.
- Optimised local manufacturing capacity, research and development and intellectual property.

Key milestones

2017/18 Q1: Gazetting of the Draft Sector Code for public commentary.

2017/18 Q2: Analysis of comments and consolidation of the final sector code.

2017/18 Q3: Launch of the Charter; further advocacy and stakeholder engagements; implementation.

2017/18 Q4: Establish partnerships and MOUs with strategic entities to implement the Charter - i.e. supplier development of emerging black entities to be included in OEM value chains (give number), training of black engineers and artisans (give numbers).

Lead and supporting departments / agencies: the dti, Armscor and National Defence Industry Council

Supporting Departments/Agencies: EDD, DoD, DPE and AMD

4. Establishment of the South African Commercial Aviation Framework and Implementation Plan

Nature and Purpose of the Intervention

The SA aviation sector is an established sector, already exporting hi-tech parts and components to leading international OEMs and Tier 1 and 2 companies to the value of R3 bn per annum. It has a strong and global International order book, at approximately 2,000 airplanes per year for the next 19 years.

This sector has a potential to further support economic development and industrialisation by means of exports, R&D and localisation of selected bought-in technologies and processes. This potential can be realised by establishing new technologies and processes; creating a conducive environment; and partnering with global companies to spread R&D costs and expand the client base.

The Intervention is intended to significantly boost SA commercial aviation manufacturing exports through the application of an integrated Industry Growth Plan – and achieve this by growing the country's aerospace capabilities in support of future-orientated competitiveness.

The purposes of the intervention are the following:

- Doubling of the sector's manufactured exports over a period of five years as well as the localisation of imports of components (including manufactured goods required for the servicing and overhauling of airplanes);
- Growing sector employment by approximately 60% in high-tech jobs from the current base;
- Transformation of various aspects of the sector, including ownership, skills- and supplier development, with a particular emphasis on black industrialists;
- Establishing the necessary conditions to create and maintain process and product qualifications and certifications to international criteria.

Targeted Outcomes

A solid commercial aviation manufacturing framework, aligning and integrating the key enablers towards establishing a blueprint for future success of the aerospace sector.

Key Milestones

2017 Q3: Completion of the Research Study; and (subject to the positive outcome of the Study),

2017 Q4: Completion of Action Plan and collaboration with the Private Sector.

Lead Departments / Agencies: the dti, DST, DoT, DPE, DHE and Industry

Supporting Departments / Agencies: EDD, Gauteng Province, CAA, AISI, TEDA, CAV, CSIR

5. Building a Competitive Aerospace and Defence Industry through establishing a Manufacturing Cluster and Sub-Tier Development Park

Nature and Purpose of the intervention

The South African Defence-Related Industry (SADRI) has continued to grow its revenue, primarily in the export market. To maintain and expand this market, there is a need to immediately stimulate the industry's growth potential by establishing a Supplier 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, later, for a range of large to small enterprises attracted by the opportunity to do business related to the growth of the cluster.

It is expected that the CAV, as an industrial park, will benefit the local OEM suppliers of components, parts and tools, as well as associated service providers. Other relevant industries (tooling) and sectors (electro-technical, metals, chemicals, etc.) will directly or indirectly benefit from the establishment of the CAV, in addition to shared services.

This intervention will entail the following:

- Integration of sub-tier suppliers of the local industry into global supply chains by bringing aerospace and defence industry suppliers into proximity with one another and locating them next to major system integrators and anchor partners like Aerosud and Denel.
- Promotion of local innovation, new business and exports.
- Providing opportunity for incubation and entry-level manufacturing through skills development.

Targeted Outcome

Increased integration of sub-tier local suppliers into global value chains through the promotion of innovation and skills development.

Key Milestones

2017/2018 Q3: Conclusion of Electrical Services and Water and Sanitation Agreements.

2017/2018 Q4: Completion of External Electrical Bulk Services.

Lead departments / agencies: the dti and CAV

Supporting departments / agencies: EDD, DPW, DPE, DoD, DST, GPG, CoT

13. Electro-technical and white goods industries



Situational analysis

During the development of the Electro-Technical Sector Strategy in 2008, six core work-streams were defined, namely:

- To create global industry awareness of South African Electro-technical capability.
- To assist contract manufacturers to get access to large-scale contracts from multilateral institutions.
- To promote job retention and growth in the South African television manufacturing industry.
- To Increase competitiveness and quality in software development.
- To expand the domestic manufacturing base in the White Goods industry.
- Increase the production capacity of Compact Fluorescent Lamps within SACU.

Key conclusions from a review of the sector strategy commissioned by **the dti** in 2015 are that most of the 6 objectives have been successfully implemented while others have lagged in some areas. Those which have been successfully implemented are the global and local awareness programmes, the promotion of growth in the television manufacturing industry and the expansion of the domestic White Goods industry, with the access for contract manufacturers to contracts from multinationals having reduced due to some of the OEMs locating in the country to produce locally.

Sector contribution to GDP and Employment

Variable	Contribution in 2015
Contribution to GDP (Value in bn)	R363.2
Employment	285 000

Source: **the dti** 2016 Electro Technical CSP review

Generally, the observations suggest that there is high export potential in most of the subsectors which could be more effectively leveraged, especially regarding exports to the African continent.

Table 1. Overview of the South Africa Electro Technical sector

Segment	Value in 2015 (R Billion)	Export Focus	Employment	Local Manufacturing Capability	Key Players
Electrical and Power Equipment	R56.3	Not Enough	11 500	Yes	Powertech, ABB, Siemens, Schneider, African Cables, Conlog
Communication Technology	R 171.4	No	103 317	No	Vodacom, MTN, Telkom, Cell C, Neotel
ICT Industry	R 96.5	No	150 830	Yes	Microsoft, IBM, SAP, EOH, Pinnacle, Datacentrix, Mustek, BCX
Electronics	R15.0	Yes	8 000	Yes	CZ Electronics, Tellumat, Altech (UEC)
Consumer Electronics	R23.5	Not Enough	12 000	Yes	Defy, Whirlpool, Zero Appliances, Hisense, Samsung

Source: **the dti** 2016 Electro Technical CSP review

Table 2. South Africa's exports share of electro-technical goods (sub-sectors) - 2014

Electrotechnical Sub-Sectors	
Sub-Sector	Share of South Africa Exports (2014)
Consumer Electronics	8.5%
Electrical Engineering and Power	27.6%
Electronics	54.7%
ICT	9.2%

Source: South African Electro Technical Export Council (SAEEC) 2016/17 Business Plan

The electronics sub-sector is doing well in terms of exports, accounting for 54% of the total electro-technical exports in 2014, whilst the consumer electronics sub-sector lags behind, accounting for just 8.5% of the total exports.

The South African sub-sector that has shown the greatest capabilities and growth is that of electrical machinery and apparatus. Five of the top 10 importing countries are from Asia, while more than half of the exports go to SADC - the top 3 export destinations being Namibia, Botswana and Zambia.

Table 3. Annual Imports of HS85: Electrical Machinery and Equipment & Parts thereof; Sound Recorders and Reproducers, Television etc. (R bn)

COUNTRY	2009	2010	2011	2012	2013	2014	2015
China	15.7	18.9	21.9	19.9	40.8	36.7	50.4
Vietnam	0.6	1.4	0.9	2.1	6.1	5.7	10.2
Germany	6.0	5.1	5.1	4.9	9.5	6.0	7.5
USA	4.3	3.5	3.5	4.2	5.2	4.7	5.6
Italy	1.4	1.2	1.2	1.3	3.4	4.9	4.8
Hong Kong, China	0.7	0.9	0.7	0.7	0.9	1.5	4.1
Taiwan	1.6	1.7	2.0	2.0	2.8	2.3	2.5
United Kingdom	2.0	1.7	1.6	1.5	2.2	1.8	2.4
France	1.6	1.3	1.2	1.3	2.1	1.5	2.3
Malaysia	1.7	2.2	2.2	2.9	2.7	2.1	2.2
Rest of the world	23.2	25.9	28.6	27.9	36.0	27.7	29.6
TOTAL (R BILLION)	58.8	63.7	68.9	68.8	111.5	94.8	121.5

Source: **the dti** 2016 Electro Technical CSP review

Table 4. Annual Exports of HS85: Electrical Machinery and Equipment & Parts thereof; Sound Recorders and Reproducers, Television etc. (R bn)

COUNTRY	2009	2010	2011	2012	2013	2014	2015
Namibia	1.6	1.7	1.9	2.0	2.9	3.0	3.5
Botswana	1.5	1.5	1.9	1.9	2.1	2.2	2.4
Zambia	0.8	0.9	1.2	1.3	2.4	2.5	2.0
USA	0.4	0.5	0.6	0.7	0.8	0.8	1.7
Mozambique	0.8	0.8	1.0	1.0	1.5	1.7	1.7
United Arab Emirates	0.3	0.2	0.3	0.3	1.0	1.8	1.7
Dem Rep of Congo	0.4	0.5	0.6	1.1	1.7	1.5	1.4
Zimbabwe	0.7	0.8	0.7	0.8	1.0	0.9	1.1
Lesotho	0.4	0.7	0.8	0.7	0.9	0.7	1.0
Saudi Arabia	0.2	0.2	0.2	0.1	0.1	0.2	0.8
Rest of The World	7.5	7.0	7.7	7.5	10.0	9.9	9.9
TOTAL (R Billion)	14.5	14.7	16.9	17.3	24.2	25.2	27.2

Source: the dti 2016 Electro Technical CSP review

Figure 1. Relative Value and Contribution to employment by each Sub-Sector

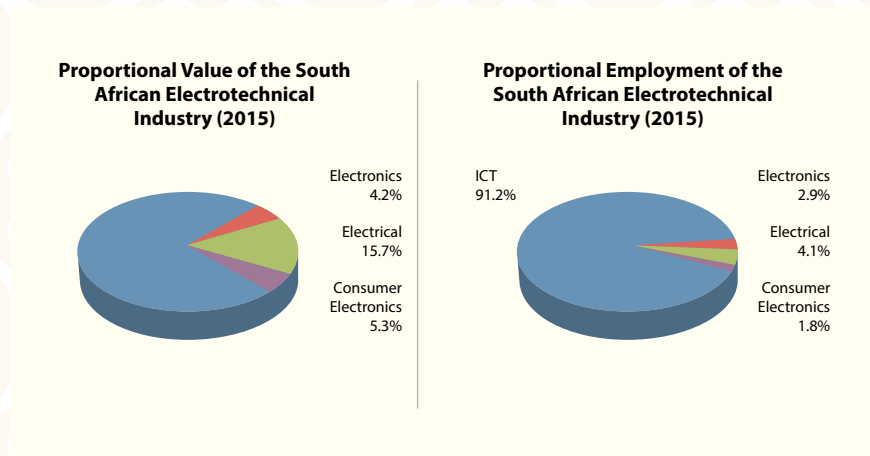
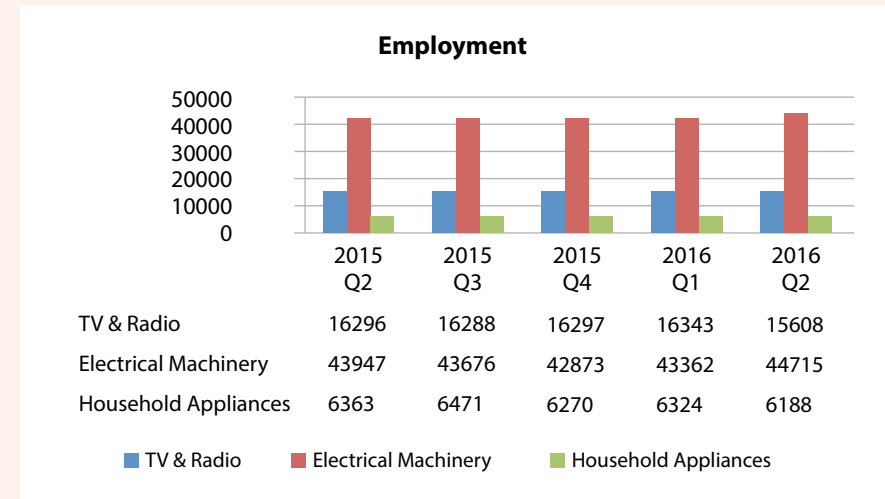


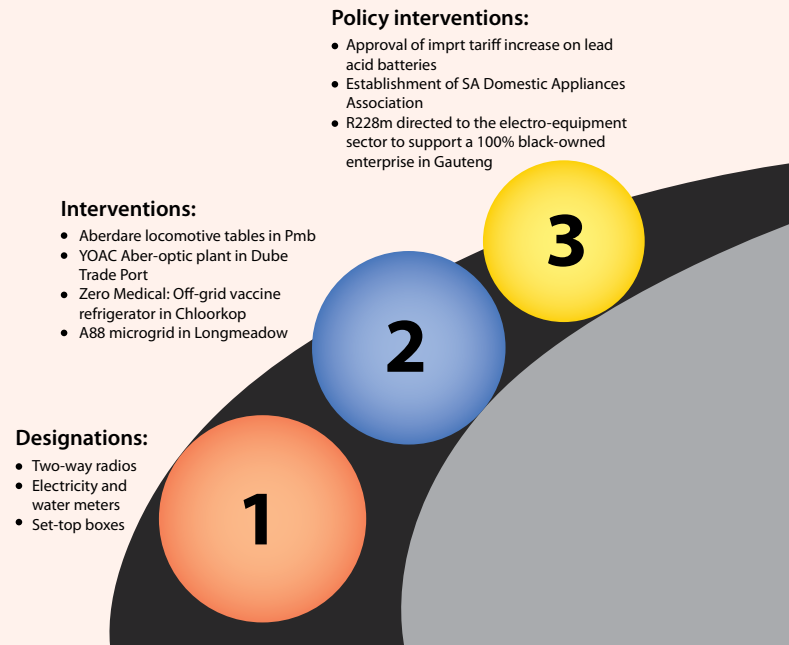
Figure 2. Employment: Q2 2015 to Q2 2016



Source: Easydata 2016

The sector is estimated to contribute 12.5% to GDP (excluding services). While employment stabilised between Q2 2015 and Q2 2016, the electrical machinery sub-sector was the only one that increased in employment during this period, gaining an additional 768 jobs.

Figure 3. Key developments in the electro-technical sector



Key Constraints

- WTO (Zero) Bound Rates on top-loader washing machines which are above 10kg; this prevents further investments into some white goods.
- Delays on the issuing of Letters of Authority (LOA).
- High cost of local content verification.
- Fragmented industry – no real association and thus difficult to engage sector.
- Illegal imports.

Key Opportunities

- Research and Development, technology and skills transfer to local manufacturers through OEMs and academia.
- Investment into the rest of the African continent. The conclusion of the Tripartite Free Trade Agreement would open further markets in the Eastern, Western, Northern and Central regions of the continent.

CASE STUDY:

Zero Medical launches SURE CHILL technology to save lives

A Ground-breaking new off the grid vaccine refrigerator technology was launched in 2015 by Zero Medical, a subsidiary of Zero Appliances, a proudly South African based refrigeration manufacturer. The new technology allows the vaccine refrigerator to run on either the mains electricity version or solar version. The Mains version requires just a few hours of power per day, once the system is fully charged. The Direct Solar version is unique, operating even at low light intensity and requires no batteries for energy storage. In any event of loss of power, both can maintain safe vaccine temperatures for up to 17 days without any power source whatsoever.

This investment has immediately created an additional 23 high-end specialised jobs for production to the South African market and there is huge potential for the African export market where harsh climates are a major challenge. Both mains and direct solar models have been independently tested within latest World Health Organization PQS guidelines.



CASE STUDY: ABB

ABB inaugurates its first South African Microgrid

Automation technology group ABB has commissioned an integrated solar-diesel Microgrid installation – the group’s first Microgrid in South Africa – at its 96 000 m2 Longmeadow facility in Johannesburg. The site hosts ABB’s Head Office and logistics and manufacturing centre.



The Microgrid made use of power fed from the national grid and a solar photovoltaic (PV) installation, as well as a backup feed from four diesel generator sets. It was designed to ensure uninterrupted power supply to keep the lights on and the factories running during any planned or unplanned power outages on the main grid supply

The solution comprised a 1 MVA/380 kWh, battery-package Power Store, ABB’s dedicated control system for Microgrid – the Microgrid Plus, and a 5 000 m2, 750 kW rooftop PV field to boost renewable energy and provide continuity of supply during disruptions or transitions from grid to island operation.

The next step will be to deploy a cloud-based remote service system for the operation and maintenance of the Microgrid - in keeping with ABB’s Internet of Things, Services and People approach. The grid is expected to increase renewable-energy use at the Longmeadow facility, reducing carbon dioxide emissions by more than 1 000 t/y and electricity costs by 50%.



CASE STUDY:

Yangtze Optics Construction of a new r150m optical fibre cable manufacturing facility

YANGTZE OPTICS AFRICA CABLE held the official breaking ground ceremony on 13 May 2016 for its new optical fibre cable manufacturing facility in South Africa.

The company will supply optical fibre cable and Fibre to The Home (FTTH) solutions to the local telecommunications market including: Telkom, Neotel, Vodacom, MTN, Cell C, Vumatel, Prasa etc. With an envisaged manufacturing capacity of over one million fibre kilometres,

The Yangtze Optics Africa Cable optical fibre cable manufacturing facility is scheduled for completion in October 2016. Recruitment and training of key technical staff will start in September this year. The 15,000m2 manufacturing facility is expected to be fully operational by January 2017.



YOAHC plans to further invest in various manufacturing and production capacity expansions at its optical fibre cabling facility in Durban, should FTTH enjoy significant uptake and scale within the next three years. Moreover, YOAHC also plan to further invest in building optical fibre cabling facilities in North-East and North-west of Africa providing full support and commitment to the “Trans Africa Information Superhighway” construction program.

Situated at Dube Trade Port, the facility is a R150 million investment by Yangtze Optical Fibre and Cable Joint Stock Limited Company (YOFC) from the People’s Republic of China, and Mustek Limited, its BBBEE partner, a JSE-listed company. The new manufacturing facility is expected to create approximately 150 new jobs. High level technical skills development will be at the forefront of the company’s skill development programme.



1. Local procurement of Vaccine Refrigerators

Nature and Purpose of the intervention

The intervention seeks to ensure that the state procures locally produced medical fridges and to promote foreign direct investments (for assembling and manufacturing of components) to supply both South Africa and regional markets. It also seeks to review the tariff structure in this industry to support local assembling and manufacturing.

Targeted outcomes

- Increased production lines by the existing manufacturers, including OEMs and domestic investors to locally produce new products such as vaccine/medical fridges.
- A value proposition to attract global OEMs to invest in local assembly of their products.
- A sustainable market for local assemblers and contract manufacturers to supply government. This will ultimately increase value addition to locally produced devices.

Key milestones

2017/18 Q1: Industry and stakeholder consultation report completed.

2017/18 Q2: State Procuring entities consultation report completed.

2017/18 Q2: Departmental decision for designation formalised.

Lead departments/agencies: the dti

Supporting departments / agencies: EDD, NT, ITAC, Department of Health, South African Electro Technical Export Council

2. Supplier Development Programme for the White Goods industry

Nature and Purpose of the intervention

Production inputs for a number of products in the white goods industry's value chain are currently characterised by an influx of imported components, for which in some instances there is already existing local capacity. Large firms, especially OEMs, seem to be reluctant to source components such as compressors, condensers and mouldings, owing to quality and price considerations.

The supplier development programme seeks to establish close relationships between the government and large OEMs to together identify capable and ready partners to substitute imports and provide the components required as inputs into products which are assembled locally for the domestic and export markets. The programme also aims to ensure that the operational efficiencies of suppliers are improved. Selected value chains will initially be tested in agreement with the OEMs and a gradual introduction of more components will be applied. Both the suppliers and the OEMs will monitor the progress of the programme under the auspices of a collaborative governance framework which includes industry and government.

Targeted outcomes

- Adoption of best practice and standards by suppliers to the White Goods industry.
- Increased competitiveness.
- Expanded job opportunities within the country (as opposed to jobs being created in the source markets for imported components).

Key milestones

Q1 2017/18: Development of a framework for a supplier development programme, working with key industry players.

Q4 2017/18: Supplier enrolment commences.

Q4 2017/18: Application for White Goods Cluster Development Programme incentive finalised.

Lead departments/agencies: the dti

Supporting departments / agencies: EDD, NT, ITAC, South African Electrotechnical Export Council (SAEEC)

3. Localisation of products that are largely procured by the National Department of Public Works

Nature and Purpose of the intervention

The Department of Public Works' mandate is to be the custodian and manager of all national government fixed assets. It is responsible for, amongst other things, accommodation and facilities management on behalf of government departments. This includes the determination of accommodation requirements; rendering expert built environment services to client departments; and the acquisition, maintenance, upgrading and disposal of such assets. This work requires the Department to procure a number of building-related goods and services in support of the building maintenance programme.

Several products which are procured under this dispensation are from the electro-technical industry, ranging from lighting, air conditioning, fire and smoke detectors, lifts and generators.

The purpose of this intervention is to identify the scale of imports of those products for which there is already local manufacturing capacity. Intellectual Property has been developed by some of the local manufacturers on prototypes for products such as smoke detectors. While this capacity and capability exists, state procurement from local suppliers remains low. After the identification of those products which are procured at a large scale but still imported, one or a few will be selected for further analysis towards either localisation or designation.

Targeted outcomes

To increase local production capacity and capability and to attract leading global manufacturers in the electro-technical industry through state procurement.

Key milestones

Q1 – Q2 2017/18: Finalise Action Plan.

Q3- Q4 2017/18: Finalise Localisation Report on one product procured by Public Works.

Lead departments/agencies: the dti

Supporting departments / agencies: EDD, DPW

dti

KEY PARTNERS AND TECHNICAL SUPPORT INSTITUTIONS

KEY PARTNER INSTITUTIONS



Industrial Development Corporation

Industrial Development Corporation (IDC)

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.

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



competitioncommission
south africa

Competition Commission South Africa

Investigates, controls and evaluates restrictive business practices, abuse of dominant positions and mergers.

Contact

Mr Thembinkosi Bonakele

CEO

Head Office: + 27 12 394 3200

Email: Thembinkosib@compcom.co.za

Web: www.compcom.co.za



Growing Black Economic Participation

National Empowerment Fund (NEF)

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.

Contact

Mrs Philisiwe Mthethwa

CEO

Head Office: +27 11 305 8000

Email: Mthethwap@necorp.co.za

Web: www.necorp.co.za



Export Credit Insurance Corporation of South Africa

Provides insurance cover on risks associated with investments and loan finance for capital goods and services projects in foreign countries.

Contact

Mr Kutoane Kutoane

CEO

Head Office: + 27 12 471 3800

Email: kutoane.kutoane@ecic.co.za

Web: www.ecic.co.za



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.

Contact

Dr Thulani Dlamini

CEO

Head Office: + 27 12 841 2911

Email: TDlamini@csir.co.za

Web: www.csir.co.za



International Trade Administration Commission (ITAC)

ITAC works with the Department of Trade and Industry (the dti) to create an enabling environment for fair trade through sound technical advice and effective administration of its trade instruments.

Contact

Mr Siyabulela Tsengiwe

Commissioner

Head Office: + 27 12 394 3701

Email: STsengiwe@itac.org.za

Web: www.itac.org.za



Technology Innovation Agency (TIA)

The TIA was formed through merging seven Department of Science and Technology 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.

Contact

Mr Barlow Manilal

CEO

Head Office: +27 (0) 12 472 2700

Email: Barloww.Manilal@tia.org.za

Web: www.tia.org.za



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

Dr Thulani Dlamini

CEO

Head Office: 012 841 2911

Email: TDlamini@csir.co.za

Web: www.tliu.co.za

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.

Contact

Mr Ndwakhulu Mukhufhi

CEO

Tel: +27 12 841 3836

Email: nmukhufhi@nmisa.org

Web: www.nmisa.org



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.

Contact

Mr Edward Mamadise

Acting CEO

Tel: +27 12 482 8734

Email: Edward.Mamadise@nrccs.org.za

Web: www.nrccs.org.za



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).

Contact

Dr Boni Mehlomakhulu CEO

Tel: +27 12 428 6025

Email: boni.mehlomakulu@sabs.co.za

Web: www.sabs.co.za



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.

Contact

Mr Ron Josias CEO

Tel: +27 12 394 3762

Email: Ronj@sanas.co.za

Web: home.sanas.co.za



Water Research Commission

Supporting sustainable development through research funding, knowledge creation and dissemination.

Contact

Mr Dhesigen Naidoo

CEO

Tel: +27-12-761-9300

Email: dhesn@wrc.org.za

Web: http://www.wrc.org.za

ABBREVIATIONS AND ACRONYMS

AAT	Aerosud and Aerodyne Aviation Technology	BTX	Benzene, Toluene and Xylene
ABC	Aerial Bundled Conductor	CAGR	Compound Annual growth rate
ADAM	Approach to Distribution Asset Management	CAIA	Chemical & Allied Industries Association
ADEP	Aquaculture Development and Enhancement Programme	CATIA	Computer Aided Three-dimensional Interactive Application
AECMSA	Association of Electric Cable Manufacturers of South Africa	CAV	Centurion Aerospace Village
AFD	Agence Française de Développement	CDC	Coega Development Corporation
AHRLAC	Advanced, High-performance, Reconnaissance, Light Aircraft	CDM	Clean Development Mechanism
AID	African Industrial Development	CDP	Cluster Development Programme
AIDC	Automotive Industry Development Centre	CEF	Central Energy Fund
AIDS	Acquired Immune Deficiency Syndrome	CFTA	Continental Free Trade Area
AIRN	African Industrial Research Network	CIACM	Competitiveness Improvement of Automotive Component
AIS	Automotive Investment Scheme	CIC	Customer Innovation Centre
AMA	Aerosol Manufacturing Association	CIP	Critical Infrastructure Programme
AMSA	Arcelor-Mittal SA	CKD	Completely Knock Down
AMTS	Advanced Manufacturing Technology Strategy	CMM	Coordinate Measuring Machine
APDP	Automotive Policy Development Plan	CMMI	Capability Maturity Model Integration
APDP	Automotive Production and Development Programme	CMT	Cut, Make and Trim
API	Active Pharmaceutical Ingredients	CNG	Compressed Natural Gas
API	American Petroleum Industry	COC	Centre of Competence
ARSO	African Regional Standardisation Organisation	COM	Chamber of Mines
ART	Antiretroviral Treatment	COMESA	Common Market for Eastern and Southern Africa
ARV	Anti-retroviral	CRE	Customs Risk Engine
ASCCII	Automotive Supply Chain Competitiveness Improvement Initiative	CRM	Customer Relations Management
AsgISA- EC	Accelerated and Shared Growth Initiative for South Africa - Eastern Cape	CSA	Corrugated Seamless Aluminium
ATF	Aluminium Trifluoride	CSDP	Competitive Supplier Development Programme
BASA	Establishment of the Bilateral Air Service Agreements	CSI	Corporate Social Initiatives
B-BBEE	Broad Based Black Economic Empowerment	CSID	Corporate Strategies and Industrial Development
BC	Bushveld Complex	CSIR	Council for Scientific and Industrial Research
BCA	Border Carbon Adjustment	CSP	Customised Sector Programme
BI	Black Industrialist	CSR	China South Rail
BMI	Business Monitor International	CTCP	Clothing and Textiles Competitiveness Programme
BNDES	Brazil's Banco Nacional de Desenvolvimento Econômico e Social	CTLF	Clothing Textiles, Leather and Footwear
BOP	Balance of payments	CTS	Concentrated Thermal Solar
BPS	Business Process Services	DAC	Department of Arts and Culture
BTSA	Bombardier Transportation South Africa	DAFF	Department of Agriculture, Forestry and Fisheries
		DBSA	Development Bank of Southern Africa
		DERO	Desired Emission Reduction Outcomes

DFDC	Deciduous Fruit Development Chamber	EMIA	Export Marketing and Investment Assistance
DFID	Department for Internal Development	EMU	Electric Multiple Units
DFIs	Development Finance Institutions	EPI	Extended Programme of Immunisation
DG	Director General	ERA	Enterprise Reference Architecture
DHET	Department of Higher Education and Training	ESEIC	Economic Sectors and Employment Cluster
DIP	Defence Industrial Development	ESEID	Economic Sectors, Employment and Infrastructure Development Cluster
DIPP	Defence Industry Participation	ESKOM	Electricity Supply Commission
DIRCO	Department of International Relations and Cooperation	ESO	Energy Systems Optimisation
DMR	Department of Mineral Resources	EU	European Union
DoC	Department of Communications	EV	Electric Vehicle
DOD	Department of Defence	FAA	Federal Aviation Authority
DoE	Department of Energy	FAT	Free Trade Area
DoH	Department of Health	FAW	First Automotive Works
DoJ	Department of Justice	FDI	Foreign Direct Investment
DoL	Department of Labour	FET	Further Education and Training
DoT	Department of Transport	FIETA	Forest Industries Education and Training Authority
DPE	Department of Public Enterprises	FILDA	International Fair of Luanda Trade Exhibition
DPW	Department of Public Works	FMCG	Fast Moving Consumer Goods
DRDLA	Rural Development & Land Affairs	FPM	Fibre Processing and Manufacturing
DST	Department of Science and Technology	FPSO	Floating Production Storage & Offloading
DTH	Direct to home television	FREC	Ford Resource and Engagement Centre
DTS	Drilling Technical Services	FRIDGE	Fund for Research into Industrial Development Growth and Equity
DTT	Digital Terrestrial Television	FRP	Fibre-reinforced polymer
DWEA	Department of Water and Environmental Affairs	FSA	Food Safety Agency
EAC	East African Community	FSA	Forestry South Africa
EASA	European Aviation Safety Authority	FTE	Full Time Equivalents
EC	Eastern Cape	FTPP	Forestry, Timber, Pulp and Paper
ECIC	Export Credit Insurance Corporation	FTTH	Fibre to The Home
EDD	Economic Development Department	GD&T	Geometric Dimensioning and Tolerancing
EE	Energy Efficiency	GDP	Gross Domestic Product
EEC	Ekurhuleni East College	GE	General Electric
EGAC	Egyptian Accreditation Council	GERD	Gross Expenditure on R&D
EIA	Environment Impact Assessment	GFCF	Gross Fixed Capital Formation
EIAP	Emerging Industries Action Plan	GHG	Greenhouse Gas
EIP	Enterprise Investment Programme	GHS	Globally Harmonised System
ELIDZ	East London IDZ	GIU	Gas Industrialisation Unit
EME	Exempted Micro Enterprises		

GMP	Good Manufacturing Practice	JV	Joint Venture
GNC	Gauteng Nerve Centre	KAP	Key Action Programme
GSK	GlaxoSmithKline	KDB	Korean Development Bank
GTP	Gas to Power	KIC	Key Industrial Customers
GVA	Gross value added	KZN	KwaZulu-Natal
GW	Gigawatt	LCT	Low-Carbon Transportation
GWH	Gigawatt Hour	LED	local economic development
ha	hectares	LGM	Lawrence Global Manufacturing
HASA	Hyundai Automotive South Africa	LLD	Large, lead and dynamic
HEIs	Higher Education Institutions	LNG	Liquid Natural Gas
HF	Hydrogen Fluoride	LOA	Letters of Authority
HIV	Human Immune Virus	LPG	Liquefied Petroleum Gas
HRC	Hot Rolled Coil	LSOH	Low Smoke Zero Halogen
HRD	Human Resource Development	m	metres
HS	Harmonised System	MACC	Mobilisation, Alignment, Capacity Building and Cooperation Manufactures
IAFA	In Africa for Africa	MBAP	Mineral Beneficiation Actions Plans
ICT	Information Communication Technologies	MCC	Medicines Control Council
IDAD	Incentive Development and Administration Division	MCEP	Manufacturing Competitiveness Enhancement Programme
IDAP	Integrated dti Aerospace Programme	MD	Master Drilling
IDC	Industrial Development Corporation	MDS	Market Demand Strategy
IDTV	Integrated Digital Television	MDSA	Master Drilling South Africa
IDZ	Industrial Development Zone	MEA	Middle East & Africa
IEE	Industrial Energy Efficiency	MerSETA	Manufacturing, Engineering and Related Services SETA
IET	Institution of Engineering and Technology	MFMA	Municipal Finance Management Act
IFPI	International Federation of the Phonographic Industry	MHCV	Medium and Heavy Commercial Vehicles
IMC	Inter-Ministerial Committee	MIC	Middle Income Countries
INES	Integrated National Export Strategy	MIDP	Motor Industry Development Programme
IOC	International Oil Companies	MNC	Multi-National Corporations
IPA	Investment Promotion Agency	MOA	Memorandum of Agreement
IPAP	Industrial Policy Action Plan	MOGS	Mining, Oil and Gas Services
IPM	Isondo Precious Metals	MoU	Memorandum of Understanding
IRP	Integrated Resource Plan	MRO	Maintenance, Refurbishment and Overhaul
ISAW	Iveco South Africa Works	MSD	Merck Sharp & Dohme
ITAC	International Trade Administration Commission	MSTF	Medium-Term Strategic Framework
ITED	International Trade and Economic Development	MTBPS	Medium-Term Budget Policy Statement
JASC	Joint Aerospace Steering Committee	MTBS	Medium Term Budget Statement
JMP	Jewellery Manufacturing Precinct		

MTIDC	Malawi-Tanzania Industrial Development Cluster	NSSS	Nuclear Steam Supply System
MW	Megawatt	NT	National Treasury
NAAMSA	National Association of Automobile Manufacturers of South Africa	NTB	Non-Tariff Barriers
NADP	National Artisan Development Programme	NTI	National Tooling Initiative
NAMB	National Artisan Moderation Body	NTP	Nuclear Technology Products
NAMC	National Agricultural Marketing Council	NYK	Nippon Yusen Kabushiki Kaisha
NAPM	National Association of Pharmaceutical Manufacturers	OEMs	Original Equipment Manufactures
NBCLI	National Bargaining Council of the Leather Industry of South Africa	OIML	Organization of Legal Metrology
NCCRP	National Climate Change Response Policy White Paper	OPIC	Overseas Private Investment Corporation
NCPC-SA	National Cleaner Production Centre, South Africa	OSD	Oral Solid Dosage
NCSDP	National Craft Sector Development Programme	OSSB	Off-Shore Supply Base
NDP	National Development Plan	OTGC	Oiltanking Grindrod Calulo
NDT	National Department of Tourism	OTIF	On-time in-full deliveries
NECSA	South African Nuclear Energy Corporation	OTMS	Oiltanking MOGS Saldanha
NEDLAC	National Economic Development and Labour Council	P-AIS	People-Carrier Automotive Investment Scheme
NEF	National Empowerment Fund	PAMSA	Paper Manufacturers' Association of South Africa
NEMA	National Environmental Management Act	PED	Pressure Equipment Directive
NEO	New Engine Option	PET	Polyethylene Terephthalate
NERSA	National Energy Regulator of South Africa	PFMA	Public Finance Management Act
NFTN	National Foundry Technology Network	PGM	Platinum Group Minerals
NFVF	National Film and Video Foundation	PGWC	Provincial Government of the Western Cape
NGMS	Next Generation Mining Systems	PI	Production Incentive
NGP	New Growth Path	PIC	Presidential Infrastructure Committee
NIPF	National Industrial Policy Framework	PIC/S	Pharmaceutical Inspection Cooperation Scheme
NIPMO	National Intellectual Property Management Office	PILC	Paper Insulated Lead Covered
NIPP	National Industrial Participation Programme	PLM	Product Life Cycle Management
NLA	National Laboratory Association	PMI	Purchasing Managers Index
NMISA	National Metrology Institute of South Africa	PPA	Power Purchase Agreement
NNR	National Nuclear Regulator	PPC	Personal Protective Clothing
NOA	National Outsourcing Association	PPP	Public Private Partnership
NPA	National Prosecuting Authority	PPPFA	Preferential Procurement Policy Framework Act
NQF	National Qualification Framework	PRASA	Passenger Rail Agency of South Africa
NRCS	National Regulator for Compulsory Specification	PSA	Proudly South African
NSDS	National Skills Development Strategy	PV	Photovoltaic
NSF	National Skills Fund	PVG	Premier Valves Group
NSI	National innovation system	PWC	PricewaterhouseCoopers
NSSD	National Strategy for Sustainable Development and Action Plan	QCTO	Quality Council for Trades and Occupations

QSE	Qualifying Small Enterprises	SAPS	South African Police Services
QSM	Quality-of-Supply Meter	SARi	South African Renewables Initiative
R&D	Research and Development	SARS	South African Revenue Services
RAAVC	Round Table Agricultural Value-chain	SASTAC	Southern Africa Sustainable Textile and Apparel Cluster
RD&I	Research, Development and Innovation	SAT	South African Tourism
RECP	Resource Efficiency and Cleaner Production	SATS	South African Technical Standard
REFIT	Renewable Energy Feed in Tariff	SCs	Science Councils
REIPP	Renewable Energy Independent Power Producers	SCSA	Space Commercial Services Aerospace Group
REIPPPP	Renewable Energy Independent Power Producer Procurement Programme	SDI	Spatial Development Initiatives
RFP	Request for Proposals	SDP	Supplier Development Plans
RFQ	Request for Qualification	SECO	Secretariat for Economic Affairs
RIBS	Rigid Inflatable Boats	SEDA	Small Enterprise Development Agency
RISDP	Regional Indicative Strategic Development Plan	SEP	Single Exit Pricing
RPO	Radiation Protection Officers	SET	Science, engineering and technology
RSDIP	Regional Spatial Development Initiatives Programme	SETA	Skills Education and Training Authorities
RSV	Resilient Seal Valve	SEZ	Special Economic Zones
RTA	Ready-To-Assemble	SIF	Sector Innovation Fund
RTE	The Rail Transport Equipment	SIFs	Specialised industrial facilities
SA	South Africa	SIP	Strategic Integrated Programmes
SAA	South African Airways	SKD	Semi-Knock Down
SaaS	Software as a Service	SME	Small and Medium Enterprises
SAAT	South African Airways Technical	SMME	Small Medium and Micro Enterprises
SABC	South African Broadcasting Corporation	SOC-ATD-TT	State-Owned Companies Artisan Development Task Team
SABS	South African Bureau of Standards	SOCs	State-Owned Companies
SADC	Southern African Development Community	SOEs	State-Owned Enterprises
SADRI	South African Defence Related Industry	SPS	Sanitary and Phyto-sanitary Standards
SAEEC	South African Electro Technical Export Council	SQAM	Standards, Quality Assurance and Metrology
SAFVCA	South African Fruit and Vegetable Canning Association	SRSA	Sumitomo Rubber South Africa
SAHC	South African Handmade Collection	SSAS	Sector Specific Assistant Scheme
SAHPRA	South African Health Products Regulatory Authority	SSEG	Small Scale Embedded Generation
SALT	South African Large Telescope	SSP	Sector Skills Plans
SANAS	South African National Accreditation System	STB	Set Top Box
SANDF	South African National Defence Force	STI	Science, Technology and Innovation
SANS	South African National Standards	SWH	Solar Water Heaters
SAOGA	South African Oil and Gas Alliance	SWOT	Strength, Weakness, Opportunity and Threats
SAOSO	South African Organics Sector Organisation	SWTAP	Sector-Wide Technology Assistance Package
		T/G	Turbine Generator

TAPMA	Thailand Automotive Parts Manufactures Association
TBT	Technical Barriers to Trade
TDCA	Development and Cooperation Agreement
TDM	Tool, Die and Mould
TEO	The Enterprise Organisation
TFA	Trade Facilitation Agreement
TFG	The Foschini Group's
TFR	Transnet Freight Rail
TFTA	Tripartite Free Trade Area
the dti	The Department of Trade and Industry
THRIP	Technology and Human Resources for Industry Programme
TIA	Technology Innovation Agency
TIDCA	Trade, Investment and Development Cooperation Agreement
TISA	Trade and Investment South Africa
TLIU	Technology Localisation Implementation Unit
TLP	Technology Localisation Programme
TNPA	Transnet National Ports Authority
TOU	Time of Use
TPA	Tonnes Per Annum
TSAM	Toyota South Africa Motors
TSP	Team Software Process
TTC	Thermal Test Chamber
TV	Television
TVC	Technology Venture Capital
TVET	Technical Vocational Education and Training
UBRDS	Ultrasonic Broken Rail Detection System
UK	United Kingdom
UNCTAD	United Nations Conference on Trade & Development
UNFCCC	United Nations Framework Convention on Climate Change
UNIDO	United Nations Industrial Development Organisation
US	United States
USAASA	Universal Service and Access Agency of South Africa
VAT	Value Added Tax
VCRT	Value-Chain Round Tables
WC	Western Cape
WCM	ASCCI's World Class Manufacturing
WHO	World Health Organization

WTO	World Trade Organisation
XPS	X-ray photoelectron spectroscopy
YOAC	Yangtze Optics Africa Cable
YOFC	Yangtze Optical Fibre and Cable
YS	Yonker Sailplanes

NOTES

