INDUSTRIAL POLICY ACTION PLAN
2017/18 - 2019/20

Economic sectors, employment and infrastructure development cluster

PART 1: A BRIEF OVERVIEW

IPAP Achievement Highlights 2016-17
Leading challenges, focus areas and action themes 2017-20
Driving innovation and technology / preparing for the 4th Industrial Revolution

Radical economic transformation: the core issues

* Structural change: inclusive growth, empowerment, diversification, localisation
* Investment in value-adding manufacture, export & labour-intensive economic sectors

Industrial policy in a turbulent world

the dti
Department:
Trade and Industry
REPUBLIC OF SOUTH AFRICA

Industrial Policy Action Plan

PART 1

IPAP 2017/18 – 2019/20

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IT IS DIVIDED INTO TWO SEPARATE BUT MUTUALLY REINFORCING DOCUMENTS

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IT IS INTRODUCED BY THE MINISTER OF TRADE & INDUSTRY, DR ROB DAVIES MP AND CARRIES A PREFACE BY MINISTER NALEDI PANDOR MP ON THE IMPORTANCE OF STI FOR SA's INDUSTRIALISATION

PART 2: THE "ENGINE ROOM" OF INDUSTRIAL POLICY

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FOREWORD BY THE MINISTER OF TRADE AND INDUSTRY

Dr Rob Davies MP

Situational and strategic overview

Welcome to this ninth annual iteration of the Industrial Policy Action Plan (IPAP) – whose publication coincides with the tenth anniversary of the adoption of the New Industrial Policy Framework (NIPF) of 2007 - the document which set out the vision for all the work that has subsequently been carried out to secure manufacturing-led growth and industrialisation in the domestic economy.

This past decade has, as I'm sure I don't need to remind you, been a hard and bruising one for both the global and the local economy. Indeed, the early iterations of IPAP, coinciding exactly with the onset of the Great Global Recession of 2008/09, got IPAP off the ground in the teeth of the most severe economic headwinds since the crash of 1929. Whilst SA's predicament has not been unique – it certainly has distinct and some unique features.

Ten years on, I believe we must reflect, unsparingly, on what industrial policy could and could not achieve in these highly testing circumstances – and on what it can achieve now and in the decades ahead. It is vital that we critically assess what has been achieved and redouble our efforts to ensure that the lever of industrial policy plays a decisive role in delivering on our shared vision of a more prosperous, dramatically less unequal, non- racist, non-sexist, South Africa.

This implies a need to come to grips firstly, as far as is practically possible, with both the extreme uncertainty of the current and immediately foreseeable global environment, as well as ongoing critical constraints and challenges in the domestic economy. It would be imprudent to underestimate the potentially huge obstacles that lie ahead. Many of these – both global and local – are addressed in considerable detail in the Economic Analysis section of this year's IPAP.

But here let me just mention some of the stand-out issues.

On the international front

- The lingering effects of the great global recession and further aftershocks: continuing weak growth and demand; global oversupply and over-capacity in key sectors; the on-going commodity slump; likely turbulence in the global trade regime, with protectionist measures increasing and the prospect of continuing aggressive market penetration of developing countries entirely predictable – all with on-going and further potentially negative impacts on the SA domestic economy, the region and Africa more generally.

- The volatile mix of geopolitical uncertainties and risks and the emergence (and apparently growing traction) of populist backlashes in the US and much of Europe, partly fuelled by the unchecked exclusion and inequality which the current model of globalisation has engendered.

- The impact of the "Fourth Industrial Revolution" - based on digitisation, robotisation, the Internet of Things and big data capabilities. In an already uncertain global environment, this will have further disruptive impacts on both developed and middle-income countries, affecting not only "how things are done" in the economy, but the whole future of manufacturing. Moreover, since its effects are likely to be felt not only in the productive sectors of the economy but also across the interlinked service sectors - including e-commerce - we have no option but to prepare ourselves as quickly and creatively as possible.

This means unpacking, not only the threats that Industry 4.0 poses – the disruptive impacts it is sure to have on existing value chains and the entire landscape of employment - but also grasping the potential opportunities for innovation that it may provide for the domestic economy.

South Africa has already begun to gear up collectively in many ways. One example is the extent to which cooperation between the mining industry, government and labour is being secured - in preparation for the economic and social step-changes that will directly impact on the mining and minerals industry.

Central to the effort to 'ride the tiger' of digitisation will be grasping the opportunities to extend and strengthen value chains through further downstream technology intensive beneficiation initiatives such as those embodied in the fuel cell roadmap and upstream localisation in mining equipment and supplies.

It is especially important, as this example demonstrates, to offset, wherever possible, the impact of disruptive technologies with support for labour-intensive manufacturing in other parts of integrated value chains which span the productive sectors of the economy. Significant opportunities of this kind already exist, have been identified and are currently being fast-tracked in this year's IPAP.

On the domestic front

The domestic economy continues to be beset by a series of deep-seated and historical structural fault-lines, which remain stubbornly difficult to overcome:

- Continued resource dependence – which at the height of the commodity boom spurred the domestic economy to reach 5% GDP growth (and in part engendered the overvaluation and volatility of the currency).

- Financialisation of the economy - with the financial sector growing at twice the rate of the productive sectors of the economy. Private sector investment has been at an average of 13% of GDP since 1994, with especially low levels of investment in the productive sectors. At the same time the domestic economy has been undergoing a process of de-industrialisation with increasingly sub-optimal performance of the primary sectors across all the key indicators (investment, output and employment).

- High levels of concentration in key sectors: with resulting sub-optimal levels of competition and high-barriers to entry for new entrants.

- Rigidities in the manufacturing sector which have meant that it has been unable to capitalise to the extent that might have been expected from the devaluation of the Rand as a comparative advantage for export performance.

- A variety of domestic shocks and cost-drivers for manufacturing:

    - electricity pricing (especially in cases where high municipal premiums are added);
    - road, rail and port logistics and inefficiencies;
    - high input costs where abuse of market power raises prices; and
    - deep-seated skills shortages and mismatches – which have acted as a barrier to growth.

- Weak growth and domestic demand and persistent unemployment - which has never fallen below 23% (on the narrow definition) – and which is inextricably linked with unsustainable race- and gender- based inequality and rural marginalisation.

- Weaknesses in government's capacity to create an enabling and supportive environment for economic growth. These weaknesses register on a variety of fronts, ranging from the fact that SA has been a laggard with respect to the roll-out of ICT infrastructure through to sub-optimal policy coherence required for a focused and integrated industrial strategy.

These constraints mean that the domestic economy - and especially the manufacturing sector - remain vulnerable. This vulnerability extends to the fact that successive waves of cut-throat import penetration have posed and are continuing to pose a clear and present danger to SA's industrial capabilities. Domestic import penetration has increasingly forced government to adopt defensive trade postures and deploy policy instruments to secure critical industrial sectors such as primary steel production, whilst at the same time working with the private sector to raise competitive capabilities.

In short, the erratic 'unwinding' of the existing model of globalisation – whether gradual of precipitous – carries with it potentially high risk factors for SA and African economies. Not the least of these is that the emerging protectionism we noted in the North (a return to some form of mercantilism) will lead to further global over-supply and 'dumping' in developing economies – placing the industrial development strategies of countries like ours under even further strain.

Expected high growth rates in Africa, on the back of the commodity slump, have not materialised; and this has impacted negatively upon what has recently become a very significant new growth area for South African exports in key sectors (partially offsetting the fall in demand from our traditional trading partners). A much greater Africa effort by SA Inc. will be necessary if the continental trade and regional industrialisation push is to bear the dividend that is hoped for.

While there has been a recent uptick in demand for some commodities, this could perhaps best be described as a temporary respite from the deep slump in both commodity-demand and prices, rather than as any kind of sustainable longer term 'correction'. Moreover, with growth in China having fallen to 6.7%, any return to the commodity super-cycle that acted as a major driver of growth in SA is highly unlikely.

The road ahead

Therefore, meeting all these manifold challenges requires drawing up a candid balance sheet of 'what has worked' and 'what doesn't work' with respect to Industrial Policy.

Being direct and to-the-point, we can say that the experience and lessons of implementing eight successive iterations of IPAP has been characterised by unevenness and much more will need to be done to secure higher impact industrial policy outcomes.

However, let me make the following observations on the record of our relative successes:

As we have stated before, there is clear evidence that Industrial Policy has been successful where:

- There has been strong intra- government policy coherence and programmes have been carefully researched and well designed;
- There has been a close and consistent collaborative relationship with the private sector, with state support dependent on clearly specified reciprocal conditionalities;
- Where programmes and interventions have been adequately resourced – e.g. Autos; Clothing, Textiles, Leather and Footwear; Business Process Services;
- Where the developmental mandates of state-owned companies (SOCs) have been aligned and implemented.

Drivers of IPAP 2017 - 2020

- A redoubled commitment to Radical Economic Transformation, coupled with systematic, interlinked initiatives to shift the productive base of the economy away from the inherited colonial division of labour and create decent sustainable jobs - particularly for the most marginalised and vulnerable groups in our society.
- Ongoing efforts to secure shared and inclusive growth, encompassing transformation of ownership (equity); substantive management control; and an economic strategy that focuses on value-addition and labour-intensity across value chains – a condition for all government incentive support.
- Rapid acceleration of the Black Industrialists Programme – moving from a start-up target of 30 projects per year for the first two years up to 100 projects across the span of FYs 2017/18 – 2019/20.

So: what is to be done?

Starting out from the positives: IPAP has scored significant successes in a number of key areas – as set out in the Achievement Highlights section of successive IPAP iterations – saving many firms and jobs, supporting sectors which are indispensable to SA's prospects for longer term industrialisation and opening new areas of economic growth to build on our comparative advantages and create globally competitive industrial capabilities.

Our domestic economy is faced with multiple challenges, which can only be overcome by the shared effort that has characterised many of the successes of the post-apartheid period, underpinned by the experience of implementing a decade of industrial policy.

Therefore, the **key guiding principles and themes of IPAP 2017/18-2019/20,** which builds on all the previous iterations, are as follows:

- **The need to raise aggregate domestic demand** – mainly through public procurement and efforts to persuade the private sector to support localisation and local supplier development across all sectors of the economy. Localisation should become the default position of all of government and the private sector. Strengthening policy coherence and programme alignment with respect to public procurement is critical.

- The **national *Buy Back SA* campaign** must be energetically implemented, with the full support of the public sector, led by Proudly SA, the SOCs and the private sector.

- The need to **ensure a much stronger ongoing focus on labour intensity** across the value chains that link the primary and secondary sectors of the economy - agriculture, mining, manufacturing and services – and give more muscle to broader government efforts to reduce inequality and poverty.

- **A stepped-up export effort** - because of the strong economic and employment multipliers which result - with a focus on key existing exporters, emerging and export-ready firms and supporting new black-owned entrants.

- Continuing efforts to achieve a **well-regulated, integrated, development-friendly investment framework** to raise levels of productive (non-portfolio) capital inflows into the economy. SA has a strong financial sector but there is a market failure. It is imperative that a shared perspective and effort is built to secure domestic investment in the productive sectors of the economy. **Finding, nurturing and growing common cause in practical programmes and projects with government's social partners, is an imperative condition for achieving economic growth.**

- Strengthening of ongoing efforts to build a **less concentrated, more competitive economic and manufacturing structure** in which barriers to entry for new entrants are lowered across key sectors of the economy.

- Recognition that **energy-efficient production and carbon mitigation** efforts and measures will increasingly have to be applied to all sectors of the economy. It is critical that this be achieved in a stepped and incremental manner, which does not have the unintended consequence of pushing certain sectors, already impacted by significant economic shocks, over the edge. Given careful planning and co-operation with the private sector, this can open new opportunities and raise the competitiveness of domestic manufacturing.

- An understanding that the **Fourth Industrial Revolution** and disruptive technologies do constitute a clear and present threat to the competitiveness of South African industry and employment; and, therefore, that a concerted, integrated government approach to the issue is imperative.

- The ongoing effort to secure a streamlined, inter-departmental 'clearing house' to urgently secure programme alignment, deal with problems and bottlenecks and ensure that all departments, SOCs and agencies are pulling in the same direction. This has, historically, been a critical feature of all successful industrial efforts. State Owned Companies must be an integral part of the developmental effort. It is imperative that they adhere to and carry out their developmental mandate – with supplier development and localisation obligations becoming the object of rigorous oversight with respect to implementation.

In addition, the following key critical programmes will receive government's urgent attention in addition to the many programmes set out in IPAP 2017:

- A concerted national effort to lock out illegal and sub-standard imports - led by the security cluster and involving the NRCS and customs.

- Building a much stronger system of industrial finance and incentives to support and secure much higher levels of investment in the productive sectors of the economy directed towards key sectors where SA has (and wishes to further build) globally competitive industrial capabilities – e.g. fuel cells and other beneficiation and technology-intensive commercialisation initiatives; mining capital equipment; liquid fuels and petrochemicals etc.

- A stronger inter-departmental effort is being implemented to optimise technology transfer and diffusion (building on existing efforts such as the Technology Localisation Unit at the CSIR) and to commercialise 'homegrown' research and development in key sectors in which SA enjoys competitive capabilities or wishes to build these.

- A continuous effort to bring new sectors and initiatives into the industrial effort. The first building blocks of a gas industrialisation effort (and the first steps towards the creation/expansion of a thriving local gas market) are being put in place: import of LPG/LNG; gas to power RFPs and the expansion of the Sasol pipeline. Continuing integrated support for the gas industrialisation effort is critical, given its very significant economic and employment multipliers and lower carbon-intensity. IPAP 2017 also includes for the first time a chapter on water and industrialisation.

- Existing efforts to **support BB-BEE and transformation** should receive focused intra- governmental support. Building on initiatives such as the Black Industrialists Programme, government should use all the demand- and supply-side levers at its disposal to nurture both emerging industrialists and their key suppliers.

- **Beneficiation:** It is important that beneficiation is not perceived as a 'stand-alone' downstream activity. South Africa must use its resource endowment across the entire mining value chain, building competitive advantages and linkages between all the productive sectors of the economy. IPAP 2017 explains how this work is being implemented.

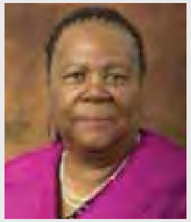
In conclusion

What has been set out above is, I hope, an honest diagnosis of the problems associated with SA's industrial effort, the multiple challenges to that effort as well as the key themes which must inform an action agenda for getting it done.

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

To all those who have been part of this collective effort - and have contributed to this latest iteration of IPAP and the broader industrial effort - I say once again: you have our deepest appreciation.

Dr Rob Davies MP
Minister: Trade and Industry



A PREFACE ON SCIENCE, TECHNOLOGY AND INNOVATION (sti)

Minister N Pandor, MP

STI is key to equitable economic growth because technological and scientific changes underpin economic development, improvements in health systems, education and infrastructure. According to the Organisation for Economic Cooperation and Development (OECD)[1] "New sources of growth are urgently needed to help the world move to a stronger, more inclusive and sustainable growth path following the financial crisis. Innovation – which involves the creation and diffusion of new products, processes and methods – can be a critical part of the solution … innovative economies are more productive, more resilient, more adaptable to change and better able to support higher living standards.

Innovation alone is not the answer to faster growth and inclusive development; however, it remains a significant, vital catalyst. In particular, it is worth noting that Sustainable Development Goal 9 (Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation) implies that "without technology and innovation, industrialisation will not happen, and without industrialisation, development will not happen."[2]

In South Africa, the centrality of STI to national development has been firmly highlighted in the National Development Plan (NDP Vision 2030). The NDP notes that developments in STI are fundamentally altering the way people live, connect, communicate and transact, with profound effect/impact on economic growth and development.[3] In addition, the NDP recognises that investments in STI are the differentiators between countries that can tackle poverty effectively by growing and developing their economies, and those that cannot.

'The extent to which developing countries emerge as economic powerhouses depends on their ability to grasp and apply insights from STI and use them creatively'[4]. In order to realise the national potential, STI investments are essential for the country's transformation towards a knowledge economy, as indicated in the NDP, White Paper and driving other policy documents.

SA's current economic situation reinforces the NDP requirement for deeper levels of science, technology, and innovation, particularly as a catalyst for industrial and economic development. STI investments can help to achieve the following:

- Grow and expand the economy via the establishment of new firms, and help increase the competitiveness of existing firms;
- Increase exports and, in some cases, reduce imports, thus helping to reduce the current account deficit; and
- Create opportunities for new and emerging black and female entrepreneurs and industrialists in support of South Africa's transformation agenda.

To maximise the impact of STI on economic and industrial development, especially in this time of fiscal strain, a number of countries are updating their science, technology and innovation policies.[5]

South Africa is also in the process of updating its STI policy to help bring about a system change, where STI is:

- recognised (as stated in the NDP) as a driver of competitiveness and economic growth,
- integrated into departmental planning across government, and;

1 OECD Innovation Strategy 2015: An agenda for policy action
2 Industrial Development Report 2016: The Role of Technology and Innovation in Inclusive and Sustainable Industrial Development;
3 National Development Plan, 2012
4 National Development Plan, 2012
5 OECD, 2015. The Innovation Imperative: Contributing to Productivity, Growth and Wellbeing. OECD Publishing, Paris

- funded appropriately to modernise the current STI system.

Several enabling activities (e.g. budget coordination) are described in more detail in the Innovation and Technology section.

South Africa has a rich and diverse culture and history. The STI system is productive, but too small. Increased effort, funding and coordination will help take it to the next level of impact on industrial and economic growth.

Naledi Pandor

Naledi Pandor MP
Minister: Science and Technology

A MESSAGE FROM THE DIRECTOR GENERAL, the dti

Lionel October

Since the adoption of the National Industrial Policy Framework (NIPF) in 2007, and through all the successive annual iterations of the Industrial Policy Action Plan, we have done our best to point out the following.

Industrial policy is a complex, interconnected set of policies and instruments. Responsibility for the industrial effort lies across government departments and agencies of government, particularly the departments comprising the Economic, Employment and Infrastructure Cluster. Each one of these is individually and collectively responsible for doing everything possible to align their work – policy and programmes – with the industrial effort.

The history of economic development strongly suggests that it is only through an industrialisation pathway that countries can propel their economies onto a course of long term, sustained growth. This is because manufacturing-led value addition and the technology intensity and skills formation which flow from these are indispensable ingredients of sustained economic growth and the movement towards a knowledge based economy. Such an industrialisation effort becomes more critical when we take into consideration the South African economy's historical resource dependence and lingering structural fault lines, including massive race-based inequality and unemployment.

Secondly, industrialisation is an enormously complex task. Creating the necessary capacity in government depends on a steady process of 'learning by doing', adjustment to global change and uncertainty and incremental course correction.

A collaborative effort between the state, the private sector and labour is critical to this effort. There is no evidence, anywhere, that either the state acting alone, or untrammelled market forces can marshal the necessary knowledge, experience or operational capacity required of a successful industrial effort.

Therefore, I make so bold as to suggest that, notwithstanding the complex challenges presented by the democratic transition and the shortcomings and mistakes made during the ten-year period since the adoption of the NIPF, we are as a country in a much better position to place the economy on a stronger growth trajectory than at any time in the past.

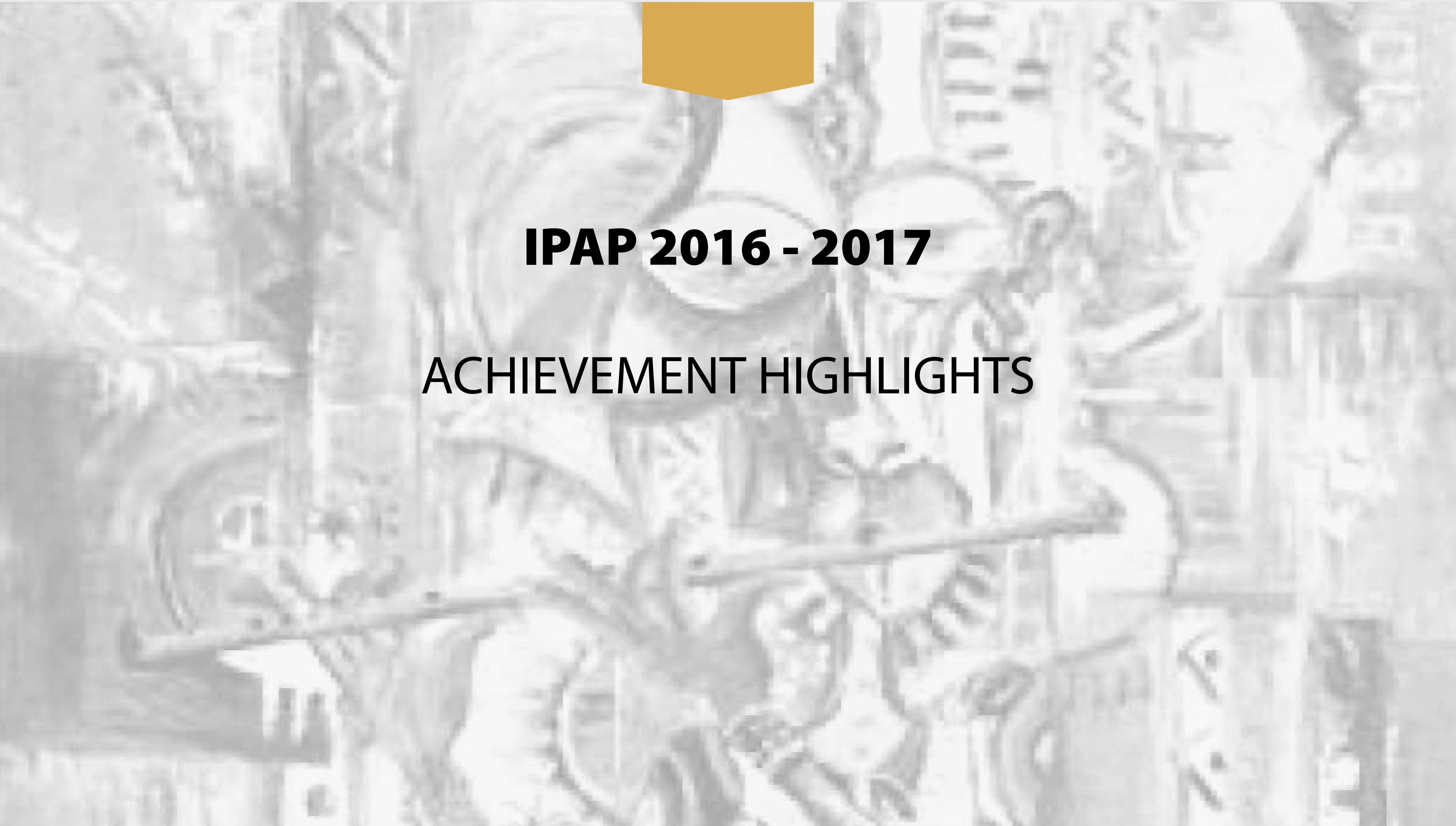
Across all the policy instruments - the transversal and sector-specific interventions set out in the NIPF and successive IPAP iterations - there has been steady progress; and a solid platform has been built to drive the process forward and open the opportunities that SA's natural and human endowments present.

Building this platform has not been easy; and I wish to place on record our gratitude to all concerned. Specifically, in the case of the preparation of IPAP 2017 – the Department of Science and Technology, the Industrial Development Corporation, the not-for-profit organisation Trade and Industrial Policy Studies (TIPS) and the Water Research Council. (Responsible for the fact that for the first time a chapter dedicated to water and industrialisation is included in the IPAP).

Without the support of these and many other departments and institutions, neither the preparation of the IPAP nor the sustained work that is done to drive the programmes set out in these pages over the year ahead would be possible.

To all involved in these institutions, from both the public and private sector, we express our deep gratitude. We urge you to redouble your efforts to secure stronger industrialisation and economic development - the only foundation stone upon which we can all build a democratic society which is no longer characterised by extreme inequality and unemployment.

Lionel October
Director General
Department of Trade and Industry



IPAP 2016 - 2017

ACHIEVEMENT HIGHLIGHTS

ACHIEVEMENT HIGHLIGHTS

The highlights listed below represent a cross-section of achievements, measured against a set of key indicators – investment, productivity improvements, domestic and global competitiveness, exports and employment (retention and creation) etc.

Achievement highlights reflect relationships between the private and the public sector. The investments and other successes that were registered in the period under review show continuing significant international confidence in the South African economy.

What they also unequivocally demonstrate is that industrial policy can and does succeed when adequately resourced, grounded in rigorous research and programme design and implemented through close collaboration between the public and private sector. The experience and lessons learned in securing these achievements must be consolidated and used as a basis for cascading the appropriate policy levers across other sectors of the manufacturing economy.

INDUSTRY RESCUE

SAVING THE STEEL INDUSTRY

Government intervened to save the steel industry in 2016 through effective use and alignment of industrial policy tools and reciprocal control mechanisms

Over the past 2 years, since the onset of the global steel crisis - characterised by massive oversupply, depressed prices and increased imports - the Inter-Departmental Task Team on iron and steel has implemented a package of measures to support and save the industry from the immediate threat of closure and subsequent loss of capacity.

The package of measures implemented to ensure the sustainability of the steel industry is as follows:

- Increase in the general rate of customs duty on primary steel products to 10%.
- Downstream support measures including tariff review on a range of downstream products and the deployment of rebates.
- Agreement on a set of principles for flat steel pricing in SA: i.e. that the product is priced appropriately to ensure that steel-dependent industries are competitive, while at the same time ensuring that the upstream steel mills remain sustainable.
- Local procurement by government:
  - undeeming of primary steel in designated products (requiring the use of locally manufactured primary steel);
  - designation of downstream steel-intensive construction products and components.
- Settlement of the Competition Commission issues with Arcelor-Mittal South Africa (AMSA).
- AMSA and government have also agreed to remove import parity pricing with immediate effect. Government has finalised the flat steel pricing principles agreement with Arcelor Mittal South Africa (AMSA). This together with the pricing remedy in the Competition Commission settlement is an important achievement in the battle against excessive flat steel pricing in the domestic market reflecting governments' commitment to protect downstream consumers of key industrial inputs.
- The reciprocal conditions attached to the above policy support measures for the primary steel industry include commitments to:
  1) Investment of at least R4.6-billion over the next 5 years to improve plant competitiveness;
  2) A competitive pricing policy;
  3) Job retention and Industrial output.
- Establishment of a Steel Industry Competitiveness Fund – to be administered by the IDC - to support qualifying enterprises in the downstream steel sector.
- Investment support through 12i tax incentives.

All the above elements represent important strides towards achieving a viable, competitive and sustainable steel industry in SA.

Compliance is independently monitored and evaluated by the International Trade and Administration Commission (ITAC) Steel Committee, consisting of ITAC Commissioners, representatives of the downstream and upstream steel industry and invited government officials.

MINING R&D PRECINCT

Emerging from the Mining Phakisa deliberations, a key strategic theme that all stakeholders agreed upon was that for South Africa to once again establish itself as a centre of excellence for the development of goods and services in the mining sector, it had to rebuild its R&D capability.

This importantly resulted in the resurrection of the old COMRO Mining Hub at the CSIR facility in Melville.

The facility has been allocated an operational and capital expenditure budget for the next 3 years until it is self-sustaining, coupled with a significant contribution from industry.

Since its opening in May 2016, CSIR has moved its mining scientists to the once dormant facility, along with representatives from the Chamber of Mines, Mining Equipment Manufacturers of South Africa, and **the dti**. There are several R&D programmes and a supplier development initiative under way at the hub.

NEW INVESTMENTS & INDUSTRIAL CAPACITY

FOREIGN DIRECT INVESTMENT

In 2016, South Africa bucked the declining trend in global foreign direct investment (FDI), registering a 38% *increase* year-on-year in FDI inflows - though these remained at the relatively low level of $2.4bn. [This, according to the latest Global Investment Trends Monitor of the United Nations Conference on Trade and Development (UNCTAD)].

PUBLIC SPENDING

Public expenditure by Government increased by R14 billion to R272 billion in 2015, with R36 billion spent on power generation projects and R35 billion on railway equipment.

InvestSA

In July 2016, *InvestSA*, an intergovernmental coordination and facilitation initiative to fast-track, unblock and reduce red tape, was awarded the Global Investment Promotion Agency (IPA) Award for excellence during the World Investment Forum. The award seeks to recognise best practice in IPAs or association of IPAs in forging partnerships to promote FDI that contributes to sustainable development. InvestSA is also globally recognised by UNCTAD for facilitating investment in a sustainable developmental manner.

InvestSA focuses on 4 of the 10 indicators followed by the World Bank: 1) starting a business; 2) registering property; 3) trading cross-border; and 4) enforcing contracts.

InvestSA has expanded its suite of offerings and now offers an enhanced offering of investment promotion, facilitation and aftercare. It is overseen by an IMC on Investment that is responsible for its overall coordination, alignment on investment policy, investment climate, marketing and communication of SA as an investment destination.

InvestSA is operationalising the One-Stop Shop service for all investors, with the National One-Stop Shop launched in March 2017 in Pretoria (at **the dti** Campus) and at 3 further Provincial sites to be launched by the end of 2017.

The One-Stop Shops will be focal points of contact between investors and government, enabling coordination with and between all the relevant departments involved in regulatory, registration, permit- and licence-issuing. InvestSA will provide specialist advisory and intergovernmental coordination, and will focus on fast-track unblocking of bottlenecks and red tape reduction in Government.

InvestSA has also partnered with the World Bank to improve SA's investment climate by reforming the 'ease of doing business' indicators over a period of 3 – 5 years.

The Technical Task Team of the IMC on Investment is developing top investment projects and opportunities that are already being packaged to be ready for market.

As part of its investment attractions, InvestSA has developed an investment pipeline of potential projects; and there have already been major investment announcements and launches in 2016. Major investments by (amongst others) Nestlé, Beijing Automotive International Corporation, ACWA Power, Ford, Toyota, Sumitomo Rubber, Cipla, Johnson & Johnson and 3M, have affirmed South Africa as a regional manufacturing hub.

A concerted focus, as part of InvestSA's aftercare, will be on retention and expansion of existing investments.

AUTOMOTIVE

HIGHLIGHTS OF THE YEAR INCLUDED THE FOLLOWING:

- In a joint investment project with the IDC, **Beijing Automobile International Corporation** began building its new R11 bn vehicle manufacturing plant, which is set to create 2,500 direct jobs. The plant will manufacture pickup trucks, SUVs and sedans for the African market. The plant will have an initial capacity to produce about 50,000 cars, trucks and sports utility vehicles.

- **Toyota SA** opened a R6.1bn assembly line to produce the Fortuner and Hilux. R1.9bn will go towards supplier tooling, R1.4bn to in-house tooling and the rest will be committed to in-house facilities and buildings to cater for new press machines. The project attracted five new international suppliers, while creating around 2,000 new jobs in the supply chain.

- **Ford Company SA** is to invest R11.5 million in the construction and operation of a new job training and entrepreneurial development centre. The Ford Resource and Engagement Centre (FREC) opened in October 2016.

- **Volkswagen South Africa** has invested R120-million in a new 21,000 try-out press to improve manufacturing capabilities. The new facility can produce close to 10,000 parts per day for the Polo, the Polo Cross and the local Polo Vivo models.

  Volkswagen is also to supply Kenya with up to 5,000 Polo Vivo cars a year in a move that could extend the manufacture of the car in SA beyond 2018. The German parent company signed a deal with the Kenyan government to build the Vivo at a new joint-venture plant in Kenya, starting in early 2017. The cars will be exported in kit form from VW's Uitenhage assembly plant and re-assembled in Kenya.

- **Mercedes Benz SA** was awarded a tender for the supply, maintenance and financing of 150 commuter buses to Great North Transport, with **Marcopolo SA** as the bus body builder. The approved total bid price - including repairs and maintenance - is R511.6 million over a five-year period.

- **BMW South Africa** has unveiled a purpose-built solar carport that allows its electric vehicle (EV) range to charge using the power of the sun. BMW will also expand its Shared Services Centre and IT Operations Centre, which is one of only two specialist hubs globally. The target is to expand both operations by an additional 220 people.

CLOTHING, TEXTILES, LEATHER & FOOTWEAR

(CTLF)

- Since the inception of the CTCP – a partnership between **the dti** and the IDC, managed by the IDC - support for the sector has amounted to R4.2 bn in incentives. 70,000 jobs have been saved and an estimated 9,550 new jobs have been created.

- **the dti** approved R824 million under a Production Incentive to establish one national and four sub-national clusters in partnership with local institutions. The national support measures resulted in capacity expansions by many manufacturers, the establishment of 28 new companies, creation of 2,200 sustainable jobs, growth in exports and a reduction of the trade deficit.

- Footwear manufacturing grew by 2 million pairs in quarter 1 of 2016 and employment creation continued. Exports in the leather and footwear sector have begun to increase as well.

- In 2016, a Component Cluster and Fashion Hub was initiated, as a crucial strategic move to guarantee further growth in the Footwear, Leather and Leather Goods industry.

GREEN INDUSTRIES

THE FOLLOWING IMPORTANT MILESTONES HAVE BEEN ACHIEVED:

- By October 2016, under the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) 6,376 MW of electricity had been procured from 102 renewable energy independent power producers (IPPs) in six bid rounds.

  All projects from the first two bid windows were operational and a total of 2,738 MW of electricity generation capacity from 51 IPP projects had been connected to the national grid.

- The REIPPP attracted total investments to the value of R194.1 bn, including R53 bn (27%) from foreign sources.

- It created 28,484 job years and generated R256.2 million in socio-economic development contributions and R80.5 million in enterprise development contributions.

OTHER HIGHLIGHTS

- After the successful completion of the first phase of its rooftop solar photovoltaic plant in August 2016, Emperor's Palace in Gauteng is expanding its embedded system from 1.18 to 2.72 MW. It is already producing 15% to 20% of its electricity needs during the daytime, for an equivalent of about R2 million of electricity savings per annum at current tariffs.

- Telkom completed a 3-MW solar PV installation at its headquarters in Gauteng, representing a sizeable share of its peak daytime electricity demand (7.4 MW). The plant is part of a strategy to become 100% self-reliant for its electricity needs.

- Pioneer Foods rolled out large commercial solar systems at five of its manufacturing facilities in the country, for a combined size of 2.5 MW.

- The City of Cape Town announced the extension of its MyCiTi system with 10 new electric buses. The R126-million pilot contract, which includes the provision of the buses, ancillary equipment, services, and training, would be partly offset by the income generated from selling carbon credits. The buses will be assembled locally by BYD SA in the Cape. The MyCiTi service will start taking delivery of the buses in June 2017.

- The first of 1, 098 wind turbine components are *en route* to the Northern Cape, which will soon be the largest expanse of wind turbines on the African continent. The 122 wind turbines, which together span 6,653 ha, will produce a combined output of 280 MW – which is enough to provide electricity for 240,000 average households per year.

- South Africa's Industrial Development Corporation (IDC) has signed an agreement with France's development agency, Agence Française de Développement (AFD), for a €60-million credit line aimed at local small-scale green projects. The facility will contribute to the creation and preservation of jobs at companies that are highly exposed to rising electricity and energy tariffs. In addition, technical assistance of €3-million will be made available to enable the IDC to strengthen its capacity in clean energy finance.

WIND AND SVP FARMS ENTERING OPERATION

- July 2106: The 80 MW Noupoort wind farm, in the Northern Cape: with all 35 turbines at the R1.9-billion facility commissioned and connected to the Eskom grid.

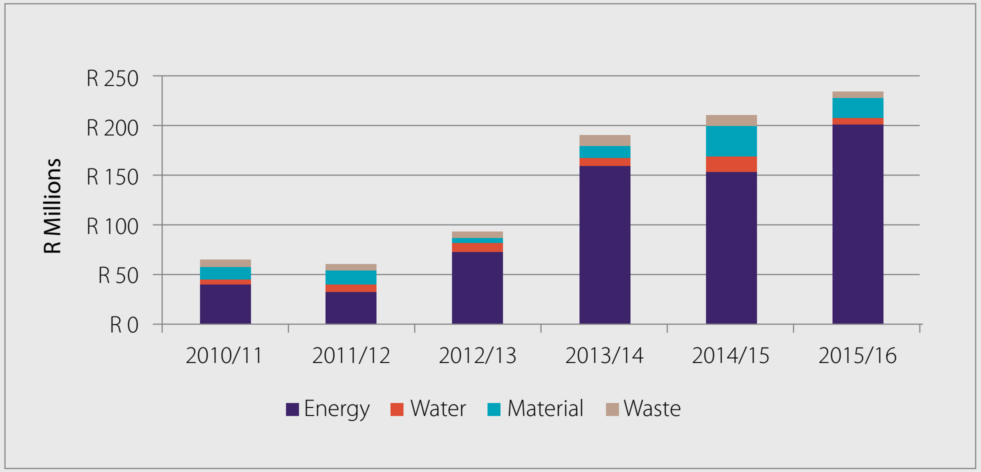
- Local independent power producer Cennergion began commercial operations at its 134 MW Amakhala Emoyeni wind farm in the Eastern Cape.

- The 86 MW Mulilo-Sonnedix-Prieska solar photovoltaic project, in the Northern Cape, has started full commercial operation. The R1.3-billion project comprises 275,000 PV modules, connected by 990 km of cable.

SUCCESS STORY: NATIONAL CLEANER PRODUCTION CENTRE (NCPC-SA)

The National Cleaner Production Centre of South Africa (NCPC-SA), created in 2002, promotes the implementation of resource efficiency and cleaner production (RECP) methodologies. The Centre is hosted by the Council for Scientific and Industrial Research (CSIR) on behalf of **the dti.**

Figure 1. Potential savings identified through the NCPC-SA's RECP programme from 2010/2011 to 2015/2016

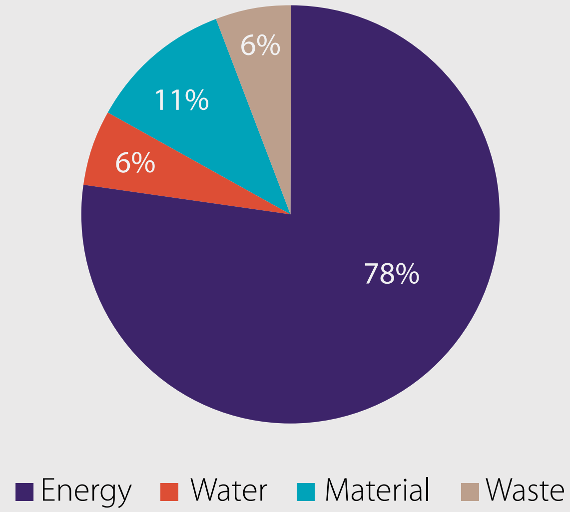


Source: NCPC, 2016

Through RECP assessments, the NCPC-SA identifies areas where industrial companies can lower production costs and save resources through water, energy, waste and materials management. Since 2010/2011, the NCPC-SA has conducted assessments in 776 plants, identifying annualised potential savings of R 853 million per annum (see Figure 1 above).

Energy accounted for 78% of the potential financial savings identified (see Figure 2 below), as a result of: (i) energy demand constraints and price increases; and (ii) the financial cost (price) of energy being higher than that of other resources, such as water. During the 2015/2016 financial year alone, 191 RECP assessments were conducted in companies across nine sectors.

Figure 2. Repartition of potential savings identified through the NCPC-SA's RECP programme from 2010/2011 to 2015/2016



Source: NCPC, 2016

Assessments identified potential savings valued at R231 million, principally in the chemicals (R 88 million), metals (R 62 million) and agro-processing (R32 million) sectors.

While a delay exists between the identification and implementation of savings opportunities (due to the need for firms to revise processes and raise capital), numerous identified opportunities have already been implemented by local industries. Actual savings accounting for R 35.5 million were realised by 36 companies in 2015/2016, principally in the energy space (98%).

BUSINESS PROCESS SERVICES (BPS)

- 6 New projects were approved in the 2016/7 financial year with a 5-year projected export revenue of R4.5 bn. R193.3 million has been disbursed thus far with 10,466 jobs sustained.90% of these jobs are those of youth.

- EXL opened its call centre in Cape Town, servicing US clients on analytics and business transformation assistance. The operation launched with 60 new jobs with plans to create 6,000 jobs within three years.

- In July 2016, South Africa secured 2 projects responsible for 688 jobs in an emerging sub sector on tutor services provided in conversational English from South Africa to learners in Asia via online face to face platform.

- Of the funding allocated to train and employ 3,000 unemployed youth under Phase 4b of the Monyetla Work Readiness Programme, by November 2016 four of the 19 companies – in Bloemfontein, Ermelo, Hammanskraal, Witbank and Tzaneen - had taken on at least 483 learners.

- Funding was approved in May 2016 for Phase 5 of Monyetla Work Readiness Programme which will train an additional 6 000 unemployed learners, leading to the achievement of a target set in 2012 to put 18 000 learners into training, with 70% gaining employment.

METAL FABRICATION, CAPITAL AND RAIL TRANSPORT EQUIPMENT

FACTORY LAUNCHES

- Bombardier Transportation launched its Propulsion and Control facility in Elandsfointein in July 2016. The new 6,000 square metre facility will produce BOMBARDIER MITRAC high power propulsion equipment for use in the Transnet Locomotives Project. The site will also be home to a testing center for high power traction converters and electrical cubicles.

- In September 2016, AVK Valves officially launched its new R200 million plant in Benoni, in partnership with Premier Valves. The plant features improved engineering processes, computer numeric-controlled machines and a training facility.

New developments in the rail programme

- MTU South Africa unveiled its newly-upgraded workshop facility in Cape Town in October 2016. It will assemble the diesel engines for the 232 diesel locomotives that China North Rail is to deliver to Transnet as part of the 1,064-locomotive build 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, which is particularly suitable 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, Transnet supplied fuel tanker wagons and container wagons to Swaziland Railway, as well as passenger coaches to Botswana.

- After a series of tests undertaken on the new PRASA-Gibela EMUs, PRASA accepted the first train in October 2016. Gibela secured 32 local suppliers for the R51bn PRASA contract, and seeks many more suppliers to produce 600 new passenger trains. 580 trains will be produced in South Africa. Gibela also signed a 19-year maintenance and technical support programme with PRASA.

SHIP/BOATBUILDING AND ASSOCIATED SERVICES INDUSTRY

- Armscor announced preferred bidders to supply ships for the Navy's projects Biro and Hotel: Southern African Shipyards and Damen Shipyards. The estimated combined value of the tenders is around R5 bn.

- A R290 million new Durban floating dock launched on the back of R160 million support through the 12i incentive.

- Fabrication of liquefied petroleum gas (LPG) vessels, or 'bullets', for an open access LPG terminal being developed at Saldanha Bay completed. The pressure vessels were fabricated domestically, and will provide 5,500 t of LPG storage capacity.

- The National Research Foundation's Research Vessel Tender to the value of R1.8 million was awarded to NautiTech.

PLASTICS AND PHARMACEUTICALS

- Mpact opened a R350 million Polyethylene Terephthalate recycling plant which created 1,000 indirect jobs. The operation has resulted in South Africa becoming the twenty-fourth country and the first on the African continent to meet Coca-Cola's certification requirements to package their soft drinks.

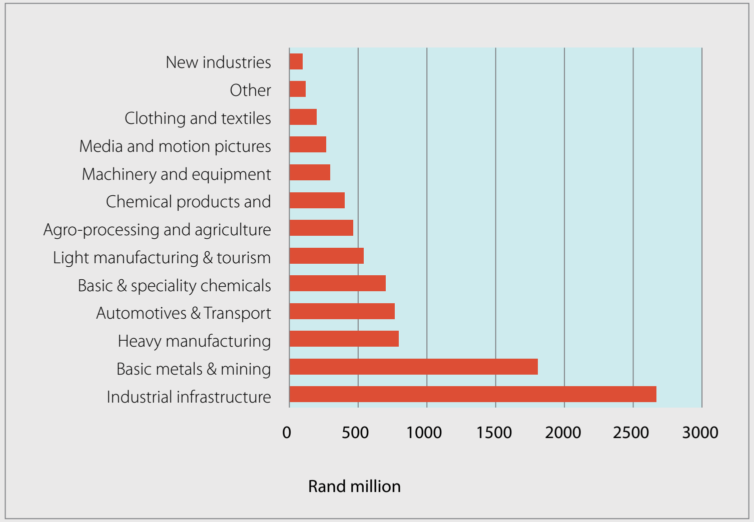
- Cipla Biotec formalised its investment in the Dube Trade Port in KZN, the first-of-it-kind facility in SA for the manufacture of biotechnology products. The facility will focus on the manufacture of biosimilars ('generic' versions of the originator biologics) for the treatment of various cancers.

  More than 60% of the locally manufactured products from this facility will be exported and will further see the creation of approximately 300 high-skilled direct and indirect jobs, most of which will be South African.

- SA Health Protecting Service, a local medical consumable supplier, is now venturing into manufacture of condoms and other medical consumables following their partnership formed with HBM. The total value of the 2015-2018 public sector condoms tender was R3.5 billion.

INDUSTRIAL FINANCING

Industrial financing interventions have significantly contributed to rescue, revival and growth in several sectors. The major source of dedicated industrial financing is the Industrial Development Corporation (IDC). Between April 2016 and February 2017, it disbursed R9.1 bn, with the following IPAP sectors benefiting from these disbursements:



INCENTIVE SCHEMES

BLACK INDUSTRIALISTS DEVELOPMENT PROGRAMME

Overall, the Black Industrialist Scheme's current support in 2016/17 shows the value of 27 approved projects to be R577 million, with a projected investment of R2.5 bn and the creation of a further 5,235 direct jobs and 1,228 indirect jobs. The sectors that received the bulk of the projected investments were Plastics and Pharmaceuticals (R1 bn), Metals (R837 million) and Agro-processing (R410 million).

Trencon Black Jills joint venture won a R400m Gibela contract to build the main site buildings at its Dunnottar train manufacturing plant on the East Rand. The plant will be used to produce the 580 trains Gibela is to supply to PRASA in fulfilment of its R51 bn contract. 21-year-old Trencon Construction is the largest black-owned construction company in South Africa. The eight-year-old Black Jills Engineering is a black-women-owned firm. Trencon would have a 70% share in the JV with Black Jil.

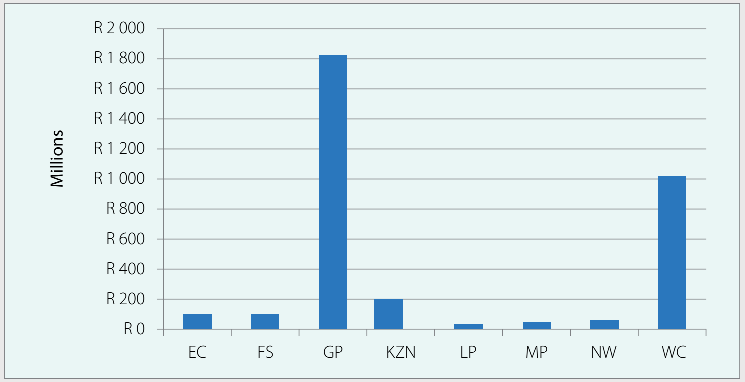
MANUFACTURING COMPETITIVENESS ENHANCEMENT PROGRAMME (MCEP)

The R1 bn loan component of MCEP has recently been reopened and is being administered by the IDC.

Between April 2012 and March 2016, about 1,552 grants and loans, sustaining 230,274 jobs, were approved, at a total value of R 5.8 bn.

Between 1 April 2016 and 31 March 2017, 377 projects across the country were supported at a total claim disbursement of R989 million supporting R3.9 bn worth of actual investment - of which, R3.68 bn in capital investment, R93.4 million in green technology and R206 million other investments at the enterprise level, supporting 70 556 jobs.

Figure 1: Supported Value of Investments per Province



*Source: **the dti***

AUTOMOTIVE INVESTMENT SCHEME (AIS)

In 2014 **the dti** amended the Automotive Investment Scheme (AIS) to enable component manufacturers to earn an additional 5% on all investments as part of deepening and strengthening local component manufacturing.

For the period April 2016 to December 2016, total support is estimated have leveraged an investment of R12.1 bn in the passenger and heavy vehicle manufacturing industry, for companies such as BMW, Hyundai, FAW, Sumitomo and Bridgestone - plus a number of foundry companies. Taken together, the investments are projected to create 2,640 new jobs.

INDUSTRIAL PARK REVITALISATION PROGRAMME (IPRP)

- Last year, **the dti** spent more than R180 million for the upgrading of six industrial parks spread across five provinces.

- This year, **the dti** has set aside R216 million for the renovation of five industrial parks with the aim of upgrading their infrastructure to contribute towards stimulating the country's industrial development, economic growth and job creation. The five industrial parks are Nkowankowa, Ekandustria, Bodirelo, Phuthaditjhaba and Garankuwa. The revitalisation programme is implemented in four phases focussing on various functional areas, with the first being upgrading of the security infrastructure.

CLUSTER DEVELOPMENT PROGRAMME

the dti initiated the pilot cluster development programme (CDP). The aim of the CDP is to enhance efficiencies and competitiveness of local firms in various economic sectors and to achieve deeper localisation, diversification and industrial transformation.

the dti has approved six cluster initiatives totalling R56.6m throughout the country. These clusters are based in the medical devices sector, composites, non-automotive, advanced manufacturing, pharmaceutical and creative industries.

12i TAX ALLOWANCE INCENTIVE SCHEME

During the period April-December 2016, 24 projects were approved, with a total investment value of R13 bn. The scheme covers companies across a wide range of sectors including steel, agro-processing, oil and gas, boatbuilding, chemicals, cement, paper, plastics, food and beverages and furniture.

AQUACULTURE DEVELOPMENT AND ENHANCEMENT PROGRAMME (ADEP)

ADEP is one of **the dti** programmes established to support and scale up production in the aquaculture sector. From 11 supported projects in the previous financial year, ADEP supported an additional 6 projects between April and September 2016, to the value of R36.6 million. This is expected to leverage R175.5 million in investment, as well as 183 new jobs. The total number of projects supported to date is 17, to a total incentive value of R85.6 million, with projected investment value of R383.3 million and 474 new jobs.

AGRO-PROCESSING

- A new Economic Partnership Agreement was concluded with the European Union (EU) and will lead to improved market access for some agricultural products, such as seafood, wine, canned fruit, sugar and ethanol.

- Efforts to diversify the agricultural base continue, with exports of apples to China, for example, up by 70%. The South African Table Grape Industry and the Department of Agriculture, Forestry and Fisheries have successfully negotiated a friendlier protocol with China which is expected to lead to significant growth in table grape exports to that country.

- Two Agri-parks are now operating, while 6 others are under construction. Large companies such as Clover, Tiger Brands, McCain and Distell are busy with initiatives to improve market access for small farmers.

- *Fruit and veg:* SA's R10 bn citrus industry has set up a non-profit entity for emerging growers, through which it will bolster dwindling production and help new players enter the lucrative export market. The Citrus Growers Association stated that the organisation would contribute R14 million to the newly formed entity.

    - **the dti** launched a R100 million tomato processing plant in Tzaneen by Dursots-All Joy. The factory is expected to assist in addressing the increased demand for tomato paste in South Africa, while at the same time ensuring business for 15 commercial farmers in the area. The plan is to ultimately employ 300 people.

    - SA-based Westfalia will start to export avocados from Mozambique to the European Union. More than 53,000 trees have already been planted.

    - In partnership with National Treasury and the deciduous fruit industry, the Western Cape provincial government has established the Deciduous Fruit Development Chamber (DFDC) Commercialisation Programme. This will disburse R120 million in funding to emerging fruit farmers to grow their businesses to fully commercial status.

The grant money will be used to renew and expand orchards, buy production equipment and upgrade farming infrastructure.

- *Chicory production:* Nestlé South Africa has inaugurated its instant coffee manufacturing plant in KwaZulu-Natal, after a R1.2 bn investment into the expansion of its factory. The investment formed part of the company's cumulative R2.9 bn investment over the past five years. The expansion included the construction of a wastewater treatment plant, a state-of-the-art coffee drying plant and a new coffee processing plant.

- *Wine:* Improved market access to the EU for South Africa's wines, where the current duty-free quota of 48 million will be doubling to 110 million litres.

    - Koopmanskloof Wines secured a deal with a Russian company to start shipping over 60,000 bottles of wine. They are also working on a long-term strategic partnership aimed at providing half a million bottles by 2020.

- *Beverages:* 2016 saw a R1 bn investment by AB Inbev in South Africa to realise localisation as part of offer to buy rival brewer SABMiller. Of the R1 billion investment, R610 million will be used to support new emerging farmers and commercial farmers to enable South Africa to change from a net importer of hops to a net exporter of hops and value-added malt.

- *Grain staples:* GWK Farm Foods unveiled a technologically advanced wheat mill, pasta plant and biscuit factory - one of the most modern and technologically advanced new food production facilities on the African continent. Of the R400 million investment, a total of R60 million was invested in an expanded silo capacity at the plant to service the new facility. More than 400 temporary employment opportunities were created during construction, while more than 100 permanent jobs have so far been created at the new plant.

EXPORT SUPPORT

TRADE & INVESTMENT SOUTH AFRICA (TISA) AND THE INTEGRATED NATIONAL EXPORT STRATEGY (INES)

Effective implementation of the Integrated National Export Strategy (INES) is inseparably interlinked with the main transversal focus areas of IPAP – i.e. increasing African regional trade, diversifying exports, maximising linkages with the domestic economy and enhancing industrial adjustment capacity.

In the financial years 2015/16 and 2016/17 (until end of December 2016), a total of 1,473 companies benefited from the advanced Global Exporter Passport Programme (GEPP) training which included modules on Introduction to Exports, Planning for Exports and Succeeding in Export Markets.

Currently, government's Export Credit Insurance Corporation of South Africa (ECIC) provides export credit insurance for capital goods and services, with political and commercial risks being covered. In 2013 a new policy was implemented increasing local content requirements to at least 70% (50% South African and 20% African) for all export-related projects supported by ECIC.

Accordingly, from April 2016 to December 2016, ECIC approved support for 3 major export-related projects totalling around R318.6 million, with a South African local content requirement of at least 50% for each of the projects. This builds on a local content value of around R3.784 bn achieved since 2011.

A total support package of R90 million from the Export Marketing and Investment Assistance Scheme (EMIA) saw export sales reach a cumulative total of R4.105 bn for the financial year 2016-2017 to date.

SPECIAL ECONOMIC ZONES

The Special Economic Zone (SEZ) programme has now entered the phase of full implementation. This is one of the major instruments **the dti** is using to accelerate industrialisation. More importantly, the SEZ programme is an especially critical tool for the attraction of foreign direct investments (FDIs), creation of decent jobs, establishment of new industrial centres and the development and improvement of existing infrastructure.

The following are recent major highlights on the implementation of the programme:

- **Policy and Legislation:** The Special Economic Zones Act has been operational as of 9 February 2016, and the work of the SEZ Advisory board has since been started. The Advisory board is responsible for advising the Minister on policy and strategy issues and the evaluation of the new applications for designation. The SEZ Planning Regulations were approved and gazetted and a Monitoring and Evaluation Framework (M & E) has been developed.

- **Designations:** Government now has a total of seven designated zones: Saldanha Bay (WC), Dube Trade Port (KZN), Coega (EC), East London (EC), Richards Bay (KZN), Maluti a Phofung (FS) and the recently added Musina (Limpopo). Musina-Makhado Special Economic Zone has been designated as the first zone under the new SEZ Act. It will be established in the Vhembe region in Limpopo and will focus on four major industrial clusters: energy and metallurgical; agro-processing; petro-chemical; and trade and logistics. The new zone has so far attracted investment interest from a Chinese consortium which is interested in leveraging the synergies of a unique cluster value chain based on abundant resources in energy and metallurgical processing. The total investment is currently estimated at approximately R56.9 bn.

- **Investments:** There has been a substantial increase in the number and value of secured but not yet operational investments. The total number increased from 47 to 72, while total value increased R19.7 bn to R41.2 bn. At least 13 of these investments are expected to be operational within the next 12 months, as soon as infrastructure development is completed.

- The following are some of the key highlights for some individual IDZs:

  - Coega IDZ launched the R11.5 bn BAIC automotive investment.
  - It has also been allocated 1,000 MW under IPP, with an investment value of R25 bn.
  - Dube Trade Port signed a R1.3 bn agreement with CIPLA to produce biosimilars.
  - Saldanha Bay IDZ has a pipeline of 34 investments worth R14 bn.
  - OR Tambo IDZ has attracted a total of R260 million in new investment covering horticulture and metal refining.
  - RBIDZ was awarded 2,000 MW under Gas IPP, with the investment value still to be determined.
  - A R40 bn metallurgical cluster within Musina Makhado SEZ has entered into the implementation phase.

BENEFICIATION

METALS AND MINERALS

- Tronox opened its new R3.3 bn Fairbreeze mineral sands mine in KZN, with its main product being titanium dioxide. 250 Direct jobs and another 1,000 indirect jobs have been created. The first R2.6 bn phase of the operation has started and will be followed by a second six-year phase, at a total cost of R3.3-bn.

- Nyanza Light Metals (in collaboration with New Zealand's Avertana Ltd) has completed pilot plant testing of the Highveld Steel & Vanadium (HSV) waste slag to produce Titanium pigment in the Richards Bay IDZ. This plant will be the only titanium pigment producer in Africa after the closure of Huntsman's Umbogontwini plant in 2015, and will create 1,300 jobs. Construction is expected to commence in 2018.

- The patented CSIR-ti-powder process is considered to be a radical innovation, with the potential to generate new industries, if developed successfully. The development of the CSIR-ti-powder production process has reached another milestone after the completion of the upgrading and recommissioning of the pilot plant. The first commercially pure titanium metals were poured in Nov 2016.

  Additional processes are also being developed for the downstream manufacturing of titanium alloy. The DST has allocated an additional R105 m, from the high-end-infrastructure fund, over the next three financial years to help accelerate the technology maturation process. Besides the emphasis on accelerating technology development, close engagement is being maintained with major aircraft OEMs and potential industrialisation partners for the ultimate industrialisation of this technology, which could see the direct production of titanium metal powder at substantially lower costs.

- De Beers has selected five black-owned cutting and polishing companies for entrepreneurship development and to improve beneficiation in the diamond sector. The programme includes interventions to improve business knowledge and gain experience in rough diamond purchasing, diamond-cutting and marketing and distribution of the finished product.

OIL & GAS

- U.S. oil major Chevron plans to sell 75 percent of its South African business unit, which includes a 110,000-barrels-a-day refinery in Cape Town. Several investors including Total, Glencore and Guvnor are rumoured to be interested in acquiring this stake.

- In September 2016, the DoE released its Preliminary Information Memorandum (PIM) for its LNG-to-Power programme. The PIM provides some helpful guidance on the proposed parameters and policy framework that will be implemented by the DoE in the procurement process.

- In May 2016, Sunrise Energy announced completion of 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. The pressure vessels, which were fabricated domestically, would provide 5,500 t of LPG storage capacity at the facility, which is set to be operational by the second quarter of 2017.

FUEL CELLS

- The Mining Phakisa identified Fuel Cells as an area for collaboration within the mining industry and between the mining industry and government.

- In early 2016, the IDC established a steering committee of mining houses, local engineering and manufacturing companies and technology providers to work with government to craft and implement a roadmap for developing a fuel cell industry in SA.

- The IDC, working with **the dti**, has prioritised the following fuel cell markets and technologies for proactive development from the perspective of attractiveness (significance of impact on South African economic growth) and competitive advantage (probability of success):

  - Stationary (combined heat and power);
  - Mobile (electric vehicles and buses);
  - Mining equipment.

KEY PROJECTS

- Impala Platinum unveiled an innovative technology that could thrust SA to the forefront of global hydrogen fuel cell developments. Implats and its strategic partners have developed a prototype fuel cell forklift with novel metal hydride technology for the on-board storage and compression of hydrogen. The forklift and refuelling station was commissioned in October 2015 and has been in operation at Impala Platinum's Base Metal Refinery in Springs.

  As part of its hydrogen fuel strategy, in the next two years Implats will build two fuel cell plants at the Springs refinery. The company has also donated land adjacent to the refineries for the Fuel Cell Hub, with potential benefits of access to metal (loan/lease arrangements, recycling). Gauteng IDZ is doing a feasibility study for the Springs Fuel Cell Hub.

- In collaboration with HySA Infrastructure, Anglo Platinum is developing fuel cell-powered mining equipment - namely a dozer and load haul dumper (LHD) - for its own operations. Testing & technology iterations are progressing positively, with innovative fuelling options.

- CSIR/Busmark/HySA is developing a bus prototype to be launched in March 2017. Autopax (PRASA subsidiary) has identified a potential demo site in Mamelodi.

COMPETITIVENESS IMPROVEMENT

NATIONAL FOUNDRY TECHNOLOGY NETWORK

- The 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 have 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 Quantas 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 reclamation processes at McWade Foundry and Inkuzi Foundry.
  - Energy management at Viking Foundry which yielded a 60% savings on energy costs.
  - Facility Layout to improve resource efficiencies and optimise layouts resulted in cost saving opportunities as well as labour productivity improvement at the following foundries: Ajax Foundry; Forbes Foundry and Melcast Foundry.

LOCALISATION

DESIGNATIONS

The following instruction notes were issued for designations during the financial year:

- Steel and steel products (This designation will ensure the maximum utilisation of existing steel fabrication capacity across the infrastructure-build programme, thereby improving competitiveness which will result in increased investments and creation of additional jobs).

- Rail signalling sector.

- Transformers and associated equipment.

- Wheelie bins.

- **the dti** invoked the 9.3 provisions of the PPPFA to engage SANRAL to secure localisation of steelworks in the Mtentu and Msikaba bridge projects to be built in the Eastern Cape and mandate local purchase of stationery procured by SOCs and municipalities.

NATIONAL INDUSTRIAL PARTICIPATION

Over the past financial year, progress has been made in supporting several local companies to improve their competitiveness and to increase their export capabilities. This has been done either through funding, technology transfer or linking local players with the global value supply chains of OEMs.

- Key highlights include the agreement between **the dti**, South African Airways Technical (SAAT) and an obligor to revive the aircraft engine maintenance, repair and overhaul capabilities of SAAT. The first phase of the project consists of transferring equipment, tools and technological process know-how from the obligor. Part of this has been achieved. The next stage is installation of the equipment and the certification of SAAT to meet the European standards without which it would not be able to carry out repairs on European-registered aircraft.

- Airbus awarded a contract to a South African manufacturer, Cobham Satcom, as a supplier for the Light Inmarsat Satcom package for the A320 NEO (New Engine Option) and the A330 NEO aircraft. This package consists of Enhanced Low Gain Antenna, Multi-Channel High Power Amplifier and a Compact Satellite Data Unit Configuration Module. It is expected that certification of the systems will commence in 2017 and installation on the aircraft platforms in 2019.

- An agreement has also been reached with Huawei to establish a Joint Innovation Centre in South Africa. In collaboration with other Huawei Centres throughout the world, this centre will focus on the development of technologies and software modules for both the domestic and international markets. The envisaged technologies include 4.5 G/5G for the cellular phone industry, smart home solutions (a household management and business communication system), mobile money technologies and application platforms for high-end smart phones. The project is expected to create 118 highly skilled jobs and generate about R5 billion in revenue over a seven-year period - of which 60% will be for export markets.

- An agreement was reached between an Obligor and the CSIR to provide a full software suite for Product Life Management (PLM) for a period of 4 years. This breakthrough will enable support for SMME development at various stages including product development, manufacturing simulation, testing and prototyping.

- The DST, via the Technology Localisation Programme, has provided funding to the value of R9 million for the Bombardier locomotive building project. ABB has co-invested to the value of R6 million in this project. The total revenue that will be generated is valued at R350 million.

TECHNOLOGY & INNOVATION

TLP: The Technology Localisation Programme

The TLP continues to be very successful in enabling firms to secure (or retain) contracts with SOCs, to develop new intellectual property (e.g. patents, technology demonstrators, manufacturing processes) and thereby either secure export orders or increase the level of components that are now manufactured in South Africa rather than imported.

Table 1. TLP outputs and impacts, 2012-Aug 2016

Number of companies supported in the development of new products	16
Total direct jobs created due to the implementation of FTAPs[6]	650
Number of companies where export capability was developed	22
Number of companies supported where import substitution was achieved	20
Number of companies that have gained work with SOCs	57
Companies supported where SOC/OEM work has been retained	65
Jobs retained at companies supported	6,500
Percentage of companies supported that are black women-owned	40%

6 FTAP = Firm Technology Assistance Package(s)

The DST has invested another R33 million in FY 2016/17 to help ensure that the Technology Stations expand their geographical footprint, extend their reach, increase opportunities for industrial growth and provide support to Africans in the 18-34-year age bracket, who suffer from the highest unemployment rate.

Since 2013, TIA has disbursed more than R1 bn in funding for various technology development projects. Approximately 70 technologies funded by the Technology Innovation Agency (TIA) have reached demonstration stage, whilst 23 technologies have been taken up by the market and become commercialised. One of TIA's primary roles is to ensure that publicly funded R&D is given maximal opportunity for commercial success.

ADVANCED MANUFACTURING

AEROSPACE AND DEFENCE

- The South African based global defence and aerospace company, Paramount, unveiled a new generation 8x8 Infantry Combat Vehicle - representing the pinnacle of land system technologies designed to meet world-wide demand for sophisticated but affordable infantry support equipment.

- Aircraft and automotive components manufacturer AAT Composites is increasing its reach into the aerospace components industry by producing specialist parts destined to be installed into the Pilatus PC-12 passenger aircraft.

- The South African-designed, developed and built Advanced, High-Performance, Reconnaissance, Light Aircraft (Ahrlac) is due to enter production in 2017, with the construction of a purpose-built factory at Wonderboom Airport in Pretoria.

- Denel Land Systems (DLS) unveiled the lightest 7.62 mm general-purpose machine gun in the world. The DMG-5 can be fitted with all modern sighting systems and is already attracting strong international interest.

- Falcon Air, also based at Wonderboom Airport, has developed and is producing the Falcon 402 single-engined passenger and utility aircraft. The Falcon 402 is an eight-seater aircraft powered by a single turboprop engine.

- A nano-satellite designed and built in South Africa was launched from the International Space Station in the first quarter of 2017 as part of the European Commission's QB50 research project. The satellite is managed by SCS Aerospace Group, South Africa's biggest private satellite concern. The camera technology being tested on the Sight1 nano-satellite was developed with initial support from **the dti**'s Aerospace Industry Support Initiative.

- Somerset West-based aircraft and automotive components manufacturer AAT Composites is increasing its reach into the aerospace components industry by producing specialist parts that are lighter and less costly than conventional metal or plastic parts. The parts are destined to be installed into the Pilatus PC-12 passenger aircraft.

ELECTRO-TECHNICAL AND WHITE GOODS

There have been some very important OEM investments in South Africa in the television and White Goods markets (including Hisense, Defy and Samsung). Government incentives and tariff reviews have contributed to enhancing South Africa's Value Proposition as an investment destination for these companies.

- **Yangtze Optics Africa Company (YOAC) launches R150m Optic fibre plant at Dube Trade Port.** (Case Study included).

  YOAC launched its R150 million investment, 15,000 m^2 fibre optic plant at Dube Trade Port on 13th May 2016, which is expected to create approximately 150 new jobs.

  The Chinese company will supply optical fibre cables and Fibre to The Home (FTTH) solutions to the local telecommunications market including: Telkom, Neotel, Vodacom, MTN, Cell C, Vumatel, PRASA etc. It will have an envisaged manufacturing capacity of over one million fibre kilometres.

- **ABB inaugurates its first South African Microgrid at Longmeadow headquarters.** (Case Study included).

  Automation technology group ABB commissioned an integrated solar-diesel Microgrid installation – the group's first Microgrid in South Africa – at its 96,000 m^2 Longmeadow facility in Johannesburg. The Microgrid makes 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.

- **Zero Medical Vaccine Refrigerator**

  A ground-breaking new off-grid vaccine refrigerator technology was launched in 2015 by Zero Medical, a subsidiary of Zero Appliances, a South African-based refrigeration manufacturer. The new technology allows the vaccine refrigerator to run on either mains electricity version or solar power. (Case Study included).

SKILLS DEVELOPMENT

NATIONAL TOOLING INITIATIVE

- The new Toolmaker Trade Test was accredited and, on 17 August 2016, the Master Toolmaker Qualification was registered by 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 7 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.

AUTO SECTOR SKILLS DEVELOPMENT

Mercedes Benz SA Learning Academy

In a R130m joint investment with government's Jobs Fund, Mercedes-Benz South Africa launched its R130 million Learning Academy. The Academy currently offers three categories of training:

- *Shop floor skills training:* targeting unemployed school/college leavers for industry where typical work-place conditions are simulated to develop an appreciation of documentation, operating instructions, team-work and work ethic.
- *Apprenticeships:* focusing on qualified unemployed school/college leavers looking for a technical career. Two streams of apprenticeship are on offer: one, automotive-related (Automotive Electrician or Motor Mechanic); the other, plant and equipment-oriented (Millwright, Electrician or Fitter and Turner).
- Advanced technology training to upskill existing artisans in the fields of robotics, plant automation and metal joining technologies.
- The MBLA further aims to be an externally accessible training facility that will offer trade tests and training and placement of unemployed persons in the industry. Currently, more than 200 learners are in training and there are plans to further increase learner intake.

CAPACITY BUILDING AND INSTITUTIONAL DEVELOPMENT FOR THE SEZ PROGRAMME

- Capacity building and institutional development is one of the key projects within the SEZ programme aimed at strengthening and building institutional capacity in developing and managing the designated SEZs.

  As part of the project, the SA government has an agreement with the Chinese government to train at least 150 South African government officials on the planning, development and management of Special Economic Zones over a period of 5 years. To date, 80 government officials from across the three spheres of government have been trained in China.

REGULATION: TECHNICAL INFRASTRUCTURE

NMISA's Laser tracker dimensional facility at NMISA upgraded for large dimensional measurements including locomotives and coaches

NMISA added a laser tracker to its existing range of Coordinate Measuring Machines (CMMs). Laser trackers, due to their large measuring range of up to 100 m with micrometre accuracy, are used for alignment of machine tools, measurement of jigs and fixtures, press alignments and assembly integration, part inspection and reverse engineering. This versatile system will be used to measure large and heavy parts which cannot be brought to the laboratory to be measured on current NMISA CMMs. This piece of equipment is of high benefit to the dimensional measurement of locomotives and coaches.

NMISA Power and Energy National Measurement Standard

NMISA has now completed the second-phase upgrade of the electrical power and energy measurement standards to support the measurements required by Eskom and municipalities for the maintenance of the national power grid and the monitoring of its distribution systems. The improved capability has been accredited successfully through SANAS and a calibration service for the extended range is now being offered to industry.

OTHER HIGHLIGHTS IN BRIEF

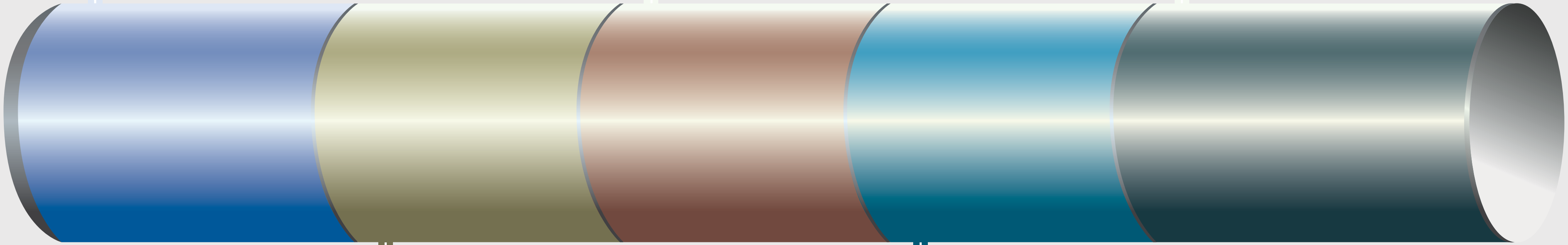
- NMISA established an internationally recognised capability for pollutant analysis.
- NMISA also established an African Feed and Food Reference Material programme to produce matrix reference materials in support of intra-Africa trade and exports.
- SANAS established a system for the accreditation of certification bodies in information security management.
- SABS is contributing towards the expansion of technology localisation through the development of standards on African Traditional Medicine (ATM) which forms part of South Africa's Indigenous Knowledge Systems (IKS).
- The Moving Ideas programme (an enterprise development initiative) was rolled out by SABS Design Institute in partnership with Transnet. It aims to assist entrepreneurs to bring their innovative ideas to life and transform their current businesses into more innovative enterprises.
- During the past two years, the NRCS oversaw the removal of approximately R753 million worth of non-compliant and unsafe products from the market. These included a consignment of 2 million dangerous incandescent lamps imported into South Africa.

Industrial policy and the South African economy:

three summary ‘snapshots’

Manufacturing: why it's critical

There are very few if any cases, at any time in economic history, where a country has achieved sustained and sustainable economic development, that have not been led by manufacturing



SA has amongst the world's highest reserves of minerals, which must be used to build competitive capabilities and advantages

The manufacturing sector has high economic multipliers because of its value-addition, linkages to the upstream production sectors of the economy (mining and agriculture) and the downstream sectors, including services; and because of its all-round contribution to strengthening integrated value chains

- Certain manufacturing sectors have high employment multipliers across the value chains
- Manufacturing drives technology and innovation through technology absorption and diffusion and research and development
- Manufacturing supports and enables the growth of national skills capacity and capabilities and the movement towards a knowledge economy

The growth of the manufacturing sector has multiple macro-benefits:
- Value-added exports break dependency on resource exports
- Reduced vulnerability of the current account to commodity cycles
- Limits currency volatility

The SA economy: strengths

South Africa is the most diversified economy in Africa. (IMF 2016)

SA is a regional manufacturing hub and gateway to Africa, with SA companies the largest investors in Africa

SA is abundantky endowed with resources which must be leveraged as a comparative advantage to secure beneficiation in key integrated value chains (e.g. PGMs)

SA ranks first in the 2016 Global Innovation Index for most technologically advanced country in Africa - but needs to put much more effort into targeted and concerted R&D activity

World class infrastructure: SA's airport infrastructure is ranked No.10 in the world (2016 Global Competitiveness Survey)

SA is a location of choice for global OEM's: ranked first in Ernst and Young's *Africa Attractiveness Survey 2016*

SA has an advanced financial services sector - though this needs to be *much more energetically leveraged to support investment in the productive sectors of the economy*

SA ranks No.2 in the soundness of its banking system (WB 2016/17 Global Competitiveness Report)

SA ranks No.3 in its regulation of the securities exchange (WB 2016/17 Global Competitiveness Report)

SA has a sound legal system and is ranked 14^{th} in the strength of its investor protection (WB 2016/17 Global Competitiveness Report)

SA ranked No.5 in the Global Climate Scope Report and SA ranks no.10 in the world for harnessing solar renewable energy

SA is the No.1 tourism destination in Africa by international arrivals

The SA economy: challenges

Continuing resource dependence
At the height of the commodity boom driving GDP growth up to 5% (and in part leading to currency overvaluation and volatility

Financialisation of the economy
F.I.R.E. sectors growing at twice the rate of the productive sectors

Deindustrialisation*
Manufacturing shrinking from a peak of 28% of GDP to just 13% over the past two decades

Lagging manufacturing investment and value-add
Since 2008, investment as a share of GDP has remained below the 25% needed for sustained economic growth

Weak domestic demand/persistent unemployment
Never falling below 23% (narrow defn.); continuing race- and gender-based inequality, rural marginalisation

Deep-seated **skills shortages and mismatches** which have acted as a barrier to growth

Continuing effects of the Great Global Economic Recession
Precipitous fall in global demand, leading to oversupply and aggressive market penetration; unwinding of the commodity super-cycle

Decline in primary sector performance
Investment, output and emploment

Domestic economic constraints
Escalating electricity prices (especially where municipal premiums added); high port and rail costs and inefficiencies; road transport externalities

Policy uncertainty / programme misalignment
Examples: weak compliance with legal procurement requirements by government depts; mining localisation; beneficiation; misalignment between SOCs' mandates & industrial policy

High input cots where private sector market power enables high pricing for key downstream sectors

Red tape, legislative and regulatory delays
Particularly with respect to securing coherent, integrated and development-friendly legislation and regulations

* Of the million SA jobs lost in the wake of the global recession, 250 000 came from manufacturing

Key Action Themes

2017-18

IPAP 2017/18: Key themes 1-3

1	**Radical Economic Transformation:** upscaled efforts to ***secure shared and inclusive growth:*** transformation of ownership and management control; empowerment through decent jobs, especially in labour-intensive sectors
2	**Programme alignment:** intensified effort to secure a streamlined, inter-departmental 'clearing house' to full align policy and programmes, deal with bottlenecks and ensure that all departments, SOCs and agencies are pulling in the same direction and supporting the industrialisation effort
3	**Cutting red tape:** continuing efforts to achieve a well-regulated, integrated, development-friendly investment framework to raise levels of productive (non-portfolio) capital inflows

IPAP 2017/18: Key themes 4-7

4	**Strengthen efforts to raise aggregate domestic demand:** mainly through localisation of public procurement and intensified efforts to persuade the private sector to support localisation and local supplier development
5	**Much stronger ongoing focus on labour intensity:** across the value chains that link the primary and secondary sectors of the economy - CTLF; Agro-processing; component manufacturing and so forth
6	**A stepped-up export effort:** with a focus on key existing exporters, emerging export-ready firms and strong support for new black-owned industrial export entrants
7	**The national *Buy Back SA* Campaign:** will be energetically implemented, with the full support of the public sector, led by *Proudly SA*, the SOCs and the private sector

IPAP 2017/18: Key themes 8-11

8	Strengthening of ongoing efforts to build a **less concentrated, more competitive economic and manufacturing structure** in which barriers to entry for new entrants are lowered
9	Building a **stronger system of industrial finance and incentives** to support and secure higher levels of investment in the productive sectors of the economy
10	Ensuring that the foreseeable effects of the **Fourth Industrial Revolution** and emergent disruptive technologies are understood, and adapting SA's productive and services sectors to meet the challenges, including those relating to employment displacement
11	**Illegal economy:** a concerted national effort to lock out illegal and sub-standard imports - led by the security cluster and involving the NRCS and customs

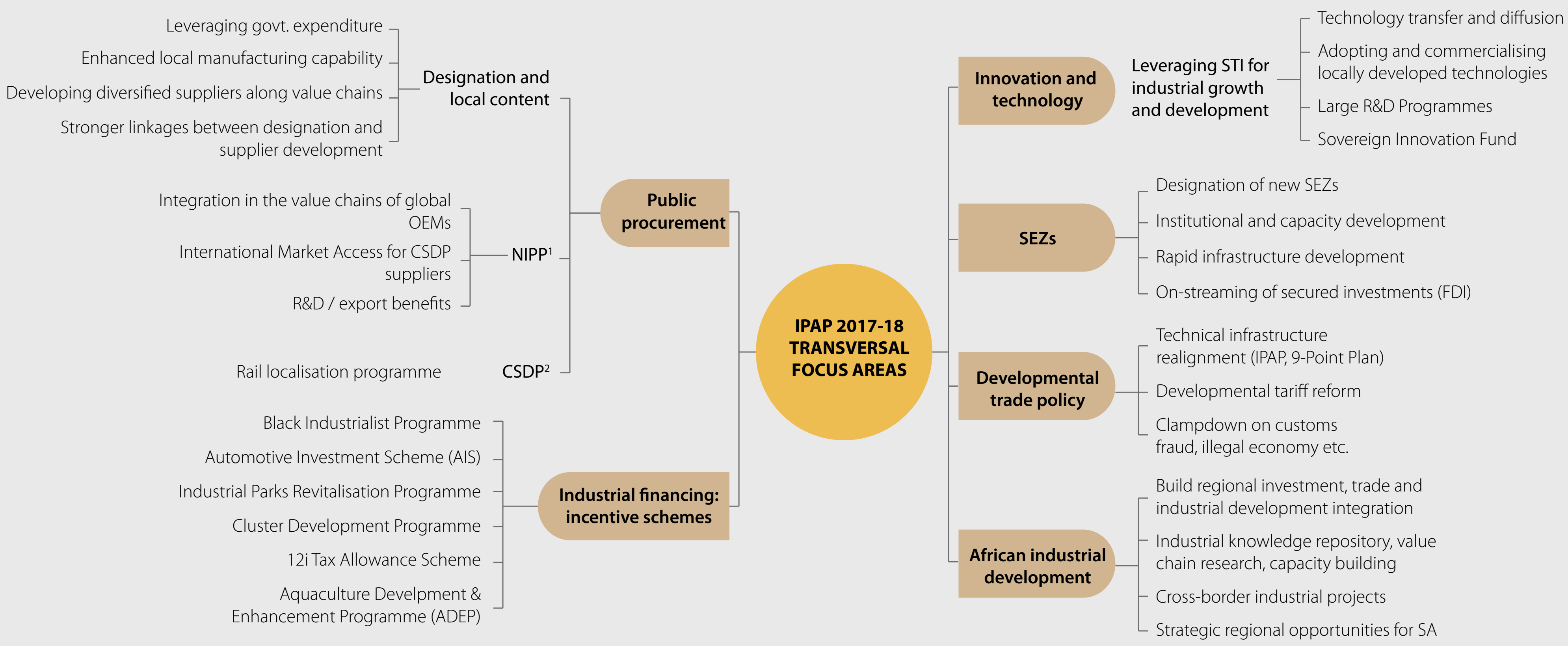
IPAP 2017/18: Key themes 12-15

12	**Beneficiation:** Ongoing effort to secure technology-intensive, value-adding production capabilities to utilise SA's comparative resource endowment advantage as a global competitive advantage
13	**Technology:** a stronger inter-departmental effort is already under way to optimise technology transfer and diffusion (building on the programmes of the CSIR's Technology Localisation Unit) and to commercialise 'homegrown' R&D in key sectors; these efforts will be further broadened and stepped up
14	**Gas Industrialisation:** First steps are already in place - LPG/LNG; gas to power RFPs and the expansion of the Sasol pipeline. Continuing integrated support for the gas industrialisation effort is critical, given its significant economic and employment multipliers and lower carbon-intensity
15	**Greening:** Driving energy-efficient production and carbon mitigation efforts and measures which will increasingly have to be phased in to all sectors of the economy in a manner that allows for sustainable adaptation

THREE GRAPHICS:

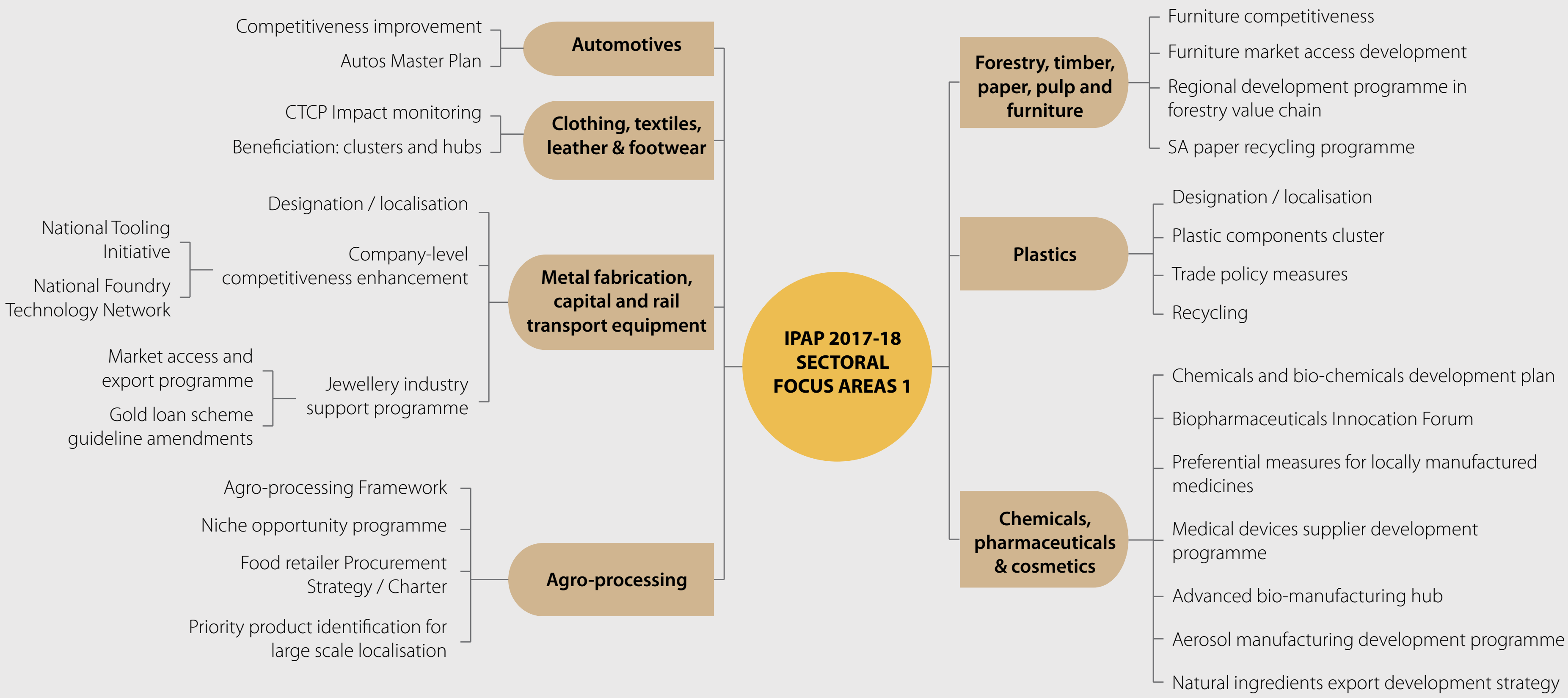
IPAP TRANSVERSAL AND SECTORAL FOCUS AREAS

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

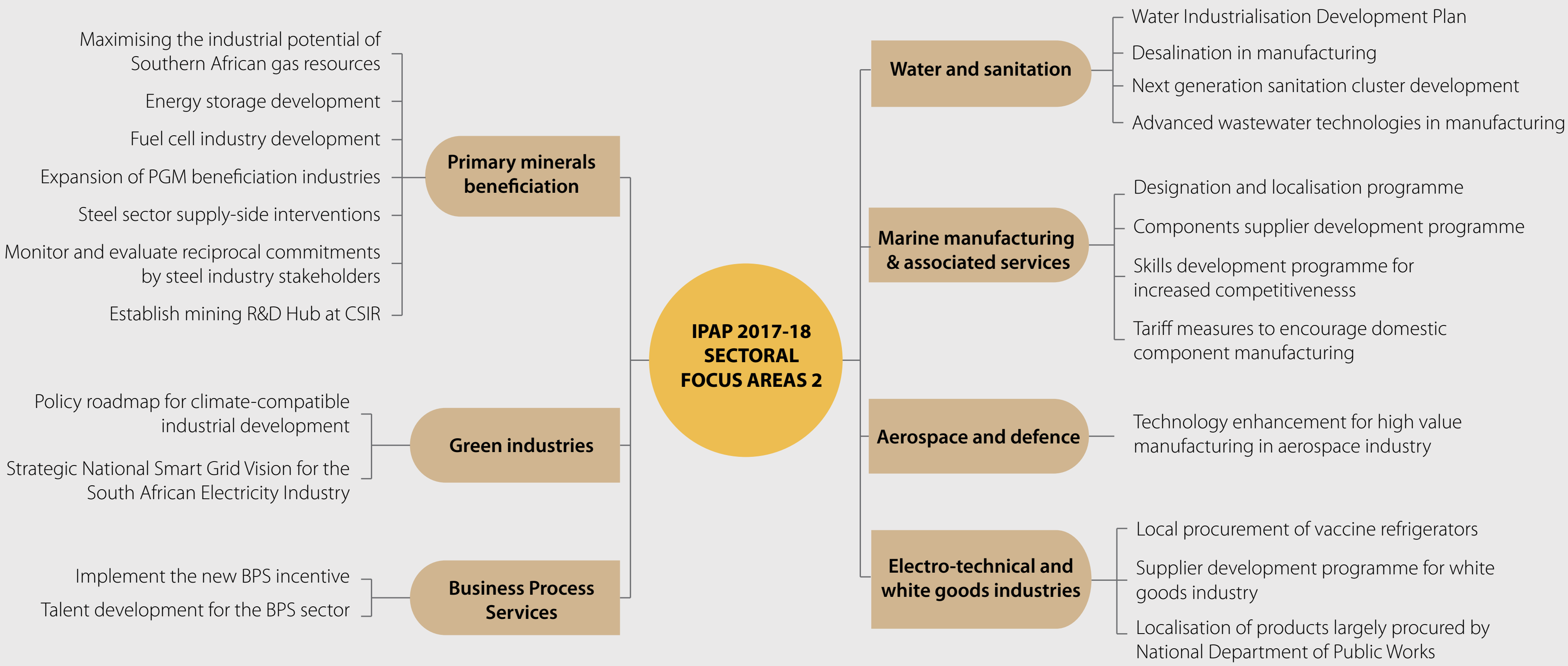


[1]National Industrial Participation Programme
[2]Competitive Supplier Development Programme

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



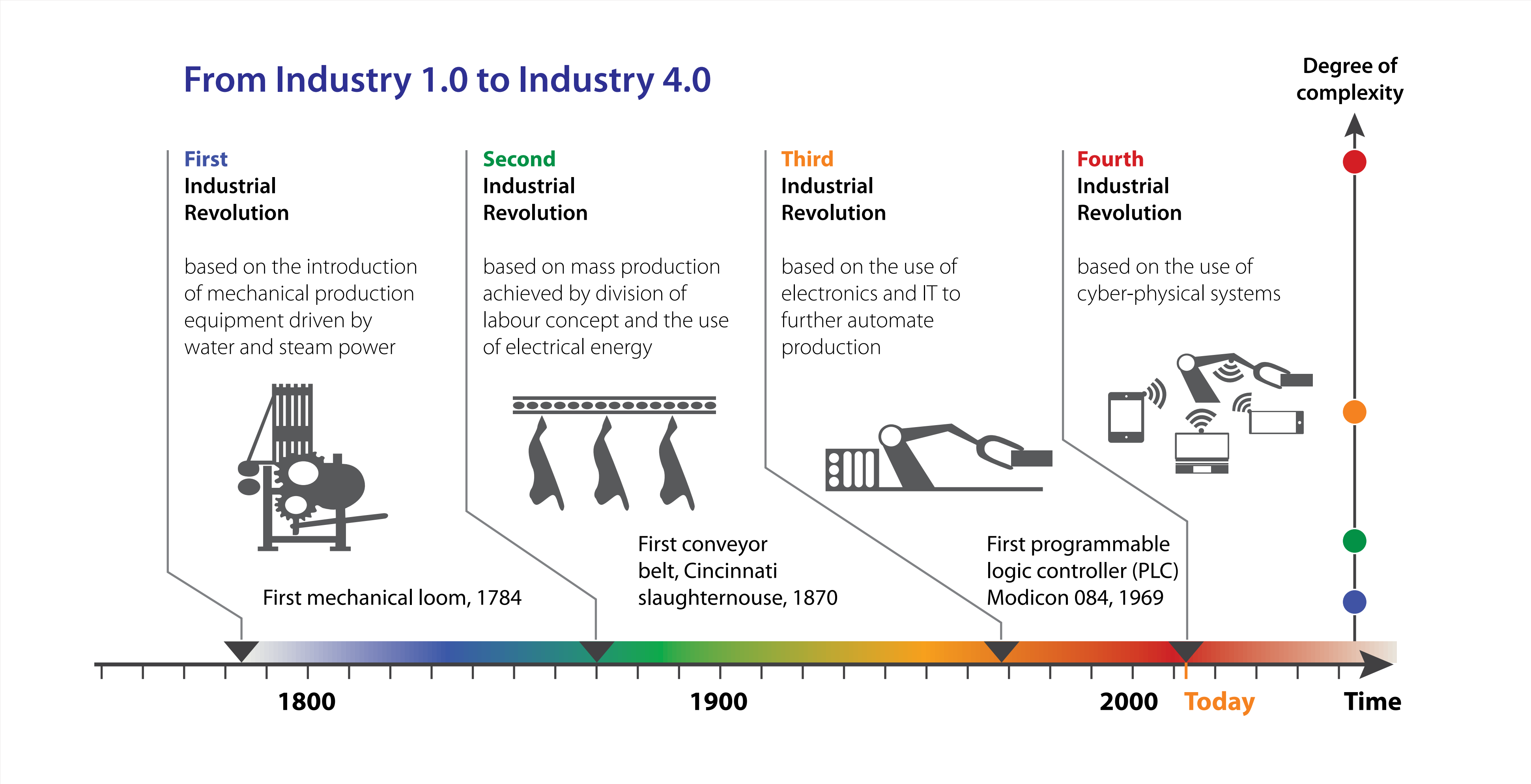
IPAP 2017/18 – 2019/20: SECTORAL FOCUS AREAS 2



Seismic change ahead:

preparing for the Fourth Industrial Revolution

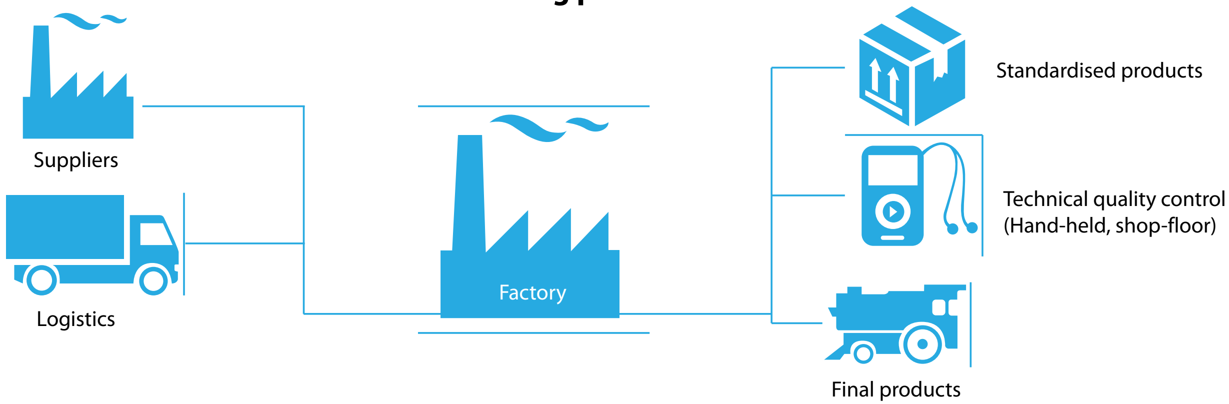
A qualitative leap into an unpredictable future



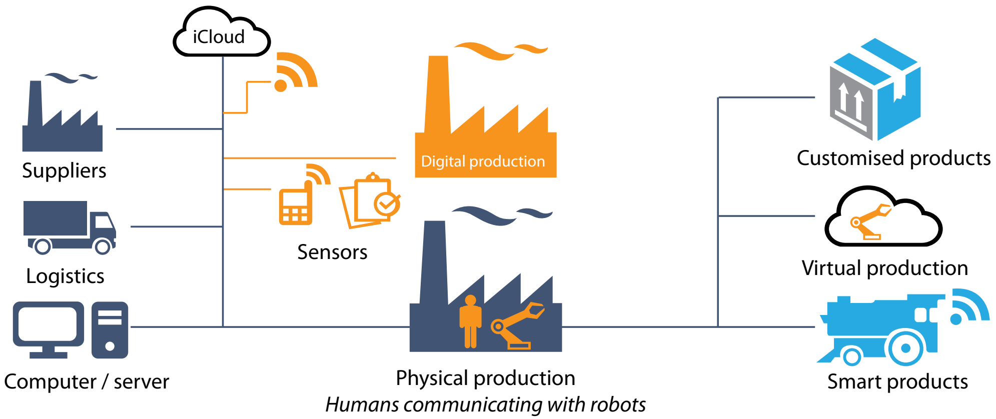
Process re-shaping under Industry 4.0

- The current manufacturing process comprises isolated and automated cells. Each single cell seeks optimisation of its operations, and manufacturing is a step-by-step process where each participant play its own role.
- Communication between participants is rather limited (especially with those further along the supply chain), as the supply chain remains particularly long.
- Manufacturing of final products is based on mass production and economies of scale in order to achieve maximum efficiency.

Current manufacturing process



Process transformation under Industry 4.0



- Industry 4.0 will transform the manufacturing process by making it more interconnected. Sensors and digital systems will allow production to speed up, and make supply chains more efficient and flexible.
- Digital production will enable companies to monetise data generated, as more flexible supply chains will enable production of custom-made and smart products.
- The Industry 4.0 concept is based on nine key technological pillars (SEE NEXT PAGE), which will reshape product design and production and create new business models and revenue streams.

A reconfigured industrial landscape: 1

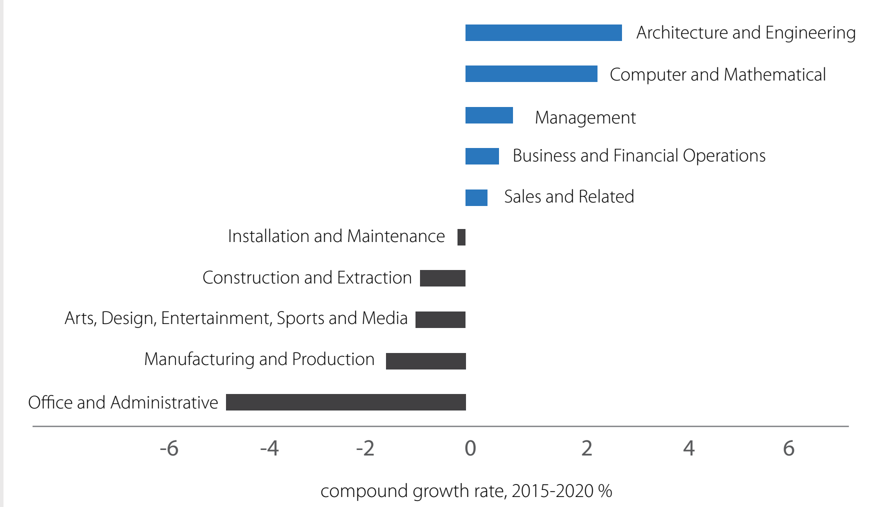
Enabling technologies

Source: BCG.

Online source:
https://www.bcgperspectives.com/content/articles/engineered_products_project_business_industry_40_future_productivity_growth_manufacturing_industries/

A reconfigured industrial landscape: 2

Job families in decline and on the rise



Source: Future of Jobs Report World Economic Forum

Jobs and skills: migration, change and response

Prospect of almost unlimited new opportunities; but knowledge and ICT skills critical to unlocking them

Many jobs are threatened by redundancy
Others job types grow rapidly but unpredictably

By importing Industry 4.0 technologies and combining them with low costs of production factors, emerging countries can leapfrog in the value chain and solve societal issues, including creating decent jobs

Strong collaboration and consensus required between government, academia, science councils, business and labour

Accelerating change in forms of employment: from 'job' to short-term contract to 'livelihood'

Existing jobs also go through step-changes in the skill sets required to perform them

Industries with wide product ranges (such as food and beverages), commodity producers (metals, agriculture) and precision-driven (pharmaceuticals and electronic components) are most likely to invest in Industry 4.0 (This could be crucial for the SA economy)

Upskilling is essential to ensure economic survival and social consent; a critical responsibility falls on the state and business for continuous, targeted training and re-training initiatives

Early South African areas of response

Aggressive technology acquisition, transfer and diffusion;
Securing inward investment from global OEMs in key strategic value chains to build global competitive capabilities
[e.g. Mining and mining capital equipment; fuel cells; aerospace and defence]

A much stronger institutional architecture to support technology transfer - building on excellent examples like the Technology Localisation Implementation Unit at the CSIR

Stepped up research and development and commercialisation efforts, led by the DST and its institutions, in close collaboration with **the dti**

Strong institutional arrangements and programmes to support innovation: tax incentives to encourage acquisition and innovation in production capabilities, new systems, processes, products and exports.

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