merSETA
MANUFACTURING, ENGINEERING AND RELATED SERVICES SETA

SECTOR SKILLS PLAN

UPDATE

2019/ 2020

PROMOTING ARTISAN DEVELOPMENT FOR EMPLOYABILITY

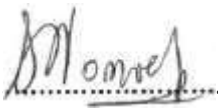
1 August 2018

OFFICIAL SIGN OFF

FINAL SUBMISSION OF REQUIRED SSP DOCUMENTS AS PER DHET GUIDELINES FOR SSP UPDATE 2019/2020

It is hereby certified that this final version of the Sector Skills Plan takes into account all the relevant policies, legislation and other mandates for which merSETA is responsible and accurately reflects the stipulated submission requirements as communicated by the Department of Higher Education and Training (DHET).

This submission comprises merSETA Cover Letter, Continuous Improvement Plan and Final SSP with the PIVOTAL list which was developed in accordance with the SSP Framework produced by DHET.

Ms S. Nomvete
Strategy and Research Executive Signature: ..  .....

Dr R. Patel
Chief Executive Officer Signature: .....  .....

Ms L. Letsoalo
Chairperson of the merSETA Accounting Authority Signature: .....  .....

1 August 2018

ACRONYMS

ABET	Adult Basic Education and Training
AEEA	African Engineering Education Association
AMEO	Manufacturers Employer Organisation
ARPL	Artisan Recognition Prior Learning
ATR	Annual Training Report
CEO	Chief Executive Officer
CEPPWAWU	Chemical Energy Paper Printing Wood and Allied Workers Union
CETEMF	Capital equipment, transport equipment, metal fabrication
CHE	Council for Higher Education
COMET	Competence Measurement in Education and Training
CSIR	Council for Scientific and Industrial Research
DHET	Department of Higher Education and Training
DoL	Department of Labour
DSAP	Dual System Apprenticeship Programme
Dti	Department of Trade and Industry
ECSA	Engineering Council of South Africa
EPA	Engineering Profession Act
FET	Further Education and Training
GDP	Gross Domestic Product
GET	General Education and Training
HEI	Higher Education Institutions
HEMIS	Higher Education Management Information System
HET	Higher Education and Training
HSRC	Human Sciences Research council
ICT	Information and Communication Technology
IDC	Industrial Development Corporation
IDZ	Industrial Development Zone
IoT	Internet of Things
IPAP	Industrial Policy Action Plan
JSE	Johannesburg Stock Exchange
MBA	Master of Business Administration
merSETA	Manufacturing, Engineering and Related Services Sector Education and Training Authority
MEWUSA	Metal and Electrical Workers Union of South Africa
MIBCO	Motor Industry Bargaining Council
MIEBC	Metal and Engineering Industries Bargaining Council
MISA	Motor Industry Staff Association
NAAMSA	National Association of Automobile Manufacturers
NDP	National Development Plan
NCV	National Certificate (Vocational)
NGP	New Growth Plan
NSDS III	National Skills Development Strategy
NSFAS	National Students' Financial Aid Scheme
NQF	National Qualifications Framework
NUMSA	National Union of Metalworkers of South Africa
OECD	Organisations for Economic Cooperation and Development
OEM	Original Equipment Manufacturers
OFO	Organising Framework for Occupations
(Pty)ltd	Private Company
PhD	Doctor of Philosophy
PICC	Presidential Infrastructure Coordination Committee
PIVOTAL	Professional, Vocational, Technical and Academic Learning
PlasticsSA	Plastics Federation of South Africa
PWD	People with Disabilities
QCTO	Quality Council for Trades and Occupations
QLFS	Quarterly Labour Force Survey
QMR	Quarterly Management Report
R&D	Research and Development
RMI	Retail Motor Industry
RPL	Recognition of Prior Learning
SADC	Southern African Development Community
SAQA	South African Qualifications Authority
SATMC	The South African Tyre Manufacturers Conference
SEIFSA	Steel and Engineering Industries Federation of South Africa
SETA	Sector Education and Training Authority
SIPs	Special Infrastructure Project
SMMEs	Small, medium and micro-enterprises
SSP	Sector Skills Plan
StatsSA	Statistics South Africa
STEM	Science, Technology, Engineering and Mathematics
TVET	Technical & Vocational Education and Training College
UASA	United Association of South Africa
UIF	Unemployment Insurance Fund
VAT	Value Added Tax
WIL	Work Integrated Learning
WSP	Workplace Skills Plan
WSS	Workplace Skills Survey

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MERSETA RESEARCH PROCESSES AND METHODS

merSETA's SSP research process should not be seen as a process consisting of phases that follow on each other. The research process should be seen as a process of various activities occurring simultaneously to ensure the most accurate data is presented in the SSP. The main activities which can be seen as part of the process, although not exhaustive include the analysis of Workplace Skills Plans (WSPs), considering Chamber research report findings, desktop research, secondary data analyses, and, consultations with the SSP committee, Governance and Strategy Committee and Chamber Committees. The WSP data is analysed for vacancies, employment, unfilled vacancies, number of companies, PIVOTAL plan, OFO codes and Chamber statistics. The WSP forms the largest, most reliable source of information from our stakeholders directly. Findings from Chamber research reports feed into the SSP as well.

The WSP for 2018 comprised information at individual employee level which yields more accurate information with respect to occupations and job titles. The data represents information from over 4600 companies, who submitted details of over 550 000 employees. The data was weighted to represent industry totals based on the levy amount paid. The levy amount from each company is used as a proxy for employment. Each of the mer sectors was weighted according to levy categories (based on size and income). The weights were then applied to each employee in the data set.

Desktop research informs the direction of sector requirements in terms of skills and informs the verification process whilst Chamber workshops enable merSETA to gain key inputs for any skills omitted in the desk research verification and anecdotal updates while also providing a context to the skills list. The Accounting Authority assists with a high level review of skills verification and anecdotal updates. The table below indicates the research projects that have fed into the 2019/2020 SSP.

Projects that have fed into the 2019/2020 SSP

Project	Topic	Study Design / methodology	Objectives	Data Collection Tool	Sample Size	Scope of Study	Data Sources Used	Time Frame
Composites Skills Mapping Project	Development of Skills and Occupation Map for	Qualitative and quantitative triangulations.	The objective of this project is to develop a skills and occupations map for the composites	Value-chain approach consisting of: compiling a value chain of the manufacturing processes, link a job or	**Total sample size:** between 20-25 companies.	A selection of companies that represent the broad scope of the composite manufacturing processes. Key staff, ECO/owner, production managers and R&D managers.	- Plastics Chamber Regional Workshops - Plastics Chamber Research Project (Phase II and Phase III).	October 2015-March 2016

	Composites Industry.		industry, in support of the Composites Industry revitalisation project spearheaded by CSIR Strategic Implementation Unit (SIU).	jobs to each mode of the value chain, compile a skills profile of each job including products or services, task, core skills and foundational knowledge. Interviews with key staff, selected plant visits.				
Project	**Topic**	**Study Design / methodology**	**Objectives**	**Data Collection Tool**	**Sample Size**	**Scope of Study**	**Data Sources Used**	**Time Frame**
Skills Supply and Demand Study (Region 1)	Skills needs in the SMME, Co-operative and non-formal sectors of the merSETA	The methodology included a combination of quantitative and qualitative approaches. These include desktop review of relevant literature, interviews with employers, training providers, trade unions, industry associations and provincial government; and field research (surveys) of the informal sector, employers and of training providers.	The primary focus of the study was to understand the skills development challenges and potential that exists across the enterprise segments within the merSETA scope of coverage. The objectives included to: Identify and document the character and scale of labour and skills needs in relation to the stakeholder segments of the merSETA	Focus Groups, Surveys, Workshops, Interviews	Interviews: 44 Surveys: 167	**The scope of region 1:** Gauteng, North West Province, Mpumalanga and Limpopo. The study covers the merSETA's formal, informal, SMME and cooperative segments across its chambers as well as merSETA regions. The scope of the study includes the following areas of inquiry: The nature and character of economic, labour market and government policy/strategy impacting on the skills needs of the different segments; - The nature and character of business operations of the different chambers and the impact thereof on skills needs	Desktop review of relevant literature, policy, legislative and regulatory frameworks and industry drivers. WSPs/ATRs, Employer Database (Levy & Non-levy Payers), Strategic Programmes e.g. Co-operatives Programme, Chamber research.	June 2017 – June 2018

			- Understand why these labour and skills needs exist (the change driver of the nature of work and of skills) - Evaluate the appropriateness of different education and skills development practices and responses in relation to labour and skills needs identified Fundamentally, the research project should assist in further developing a sustainable skills development support strategy for these sector segments and contribute to the merSETA's Sector Skills Plan (SSP) and Strategic Plan (SP).			- Insight into regional and local government developments and links to skills planning - The scale and nature of skills needs in the short to medium term in the mer sector - In-depth analysis of the unique skills systems that exist within the segments and across the provinces/regions - Challenges in relation to the supply of labour and skills - Opportunities for effective development of skills Contrasting the training approaches, activities and benefits of training for small and informal businesses with those of larger enterprises with specific attention to different modes of training, and sources of provision (public / private / workplace based, etc.)		
Project	**Topic**	**Study Design / methodology**	**Objectives**	**Data Collection Tool**	**Sample Size**	**Scope of Study**	**Data Sources Used**	**Time Frame**
Skills Supply and Demand	Skills needs in the SMME, Co-operative	The methodology included a combination of	The primary focus of the study is to understand the	Focus Groups, Surveys and Interviews	Interviews: 71 Focus groups: 15	**Region 2:** Northern Cape, Free State, Western Cape	Desktop review of relevant literature, policy, legislative and regulatory frameworks	June 2017 – June 2018

Study (Region 2)	and non-formal sectors of the merSETA.	quantitative and qualitative approaches as well as triangulation.	skills development challenges and potential that exists across the enterprise segments within the merSETA scope of coverage. While the merSETA is for the most part au fait with its levy paying stakeholders, non-levy payers and informal employment is not well understood. The study therefore seeks to identify key features of labour and skills demand and supply from employer and worker perspectives. The objectives of the study are to: - Identify and project the character and scale of labour and skills needs in relation to the stakeholder segments of the merSETA		Surveys: 732	The study covers the merSETA's formal, informal, SMME and cooperative segments across its chambers as well as merSETA regions. The scope of the study includes the following areas of inquiry: The nature and character of economic, labour market and government policy/strategy impacting on the skills needs of the different segments; - The nature and character of business operations of the different chambers and the impact thereof on skills needs - Insight into regional and local government developments and links to skills planning - The scale and nature of skills needs in the short to medium term in the mer sector - In-depth analysis of the unique skills systems that exist within the segments and across the provinces/regions - Challenges in relation to the supply of labour and skills - Opportunities for effective development of skills	and industry drivers. WSPs/ATRs, Employer Database (Levy & Non-levy Payers), Strategic Programmes e.g. Co-operatives Programme, Chamber research.	

			- Understand why these labour and skills needs exist - Evaluate the appropriateness of different education and skills development practices and responses in relation to labour and skills needs identified. Fundamentally, the research project should assist in further developing a sustainable skills development support strategy for these sector segments and contribute to the merSETA's Sector Skills Plan (SSP) and Strategic Plan (SP).			Contrasting the training approaches, activities and benefits of training for small and informal businesses with those of larger enterprises with specific attention to different modes of training, and sources of provision (public / private / workplace based, etc.)		
Project	**Topic**	**Study Design / methodology**	**Objectives**	**Data Collection Tool**	**Sample Size**	**Scope of Study**	**Data Sources Used**	**Time Frame**
Skills Supply and Demand Study (Region 3)	Skills needs in the SMME, Co-operative and non-formal sectors of	The methodology included a combination of quantitative and qualitative approaches as	The primary focus of the study is to understand the skills development challenges and	Focus Groups, Surveys and Interviews	Interviews: 74 Focus groups: 12 Surveys: 609	**Region 3:** Kwa-Zulu Natal and Eastern Cape The study covers the merSETA's formal, informal, SMME and cooperative segments across its chambers as well as merSETA regions.	Desktop review of relevant literature, policy, legislative and regulatory frameworks and industry drivers. WSPs/ATRs, Employer Database (Levy & Non-	June 2017 – June 2018

	the merSETA.	well as triangulation.	potential that exists across the enterprise segments within the merSETA scope of coverage. While the merSETA is for the most part au fait with its levy paying stakeholders, non-levy payers and informal employment is not well understood. The study therefore seeks to identify key features of labour and skills demand and supply from employer and worker perspectives. The objectives of the study are to: - Identify and project the character and scale of labour and skills needs in relation to the stakeholder segments of the merSETA			The scope of the study includes the following areas of inquiry: The nature and character of economic, labour market and government policy/strategy impacting on the skills needs of the different segments; - The nature and character of business operations of the different chambers and the impact thereof on skills needs - Insight into regional and local government developments and links to skills planning; - The scale and nature of skills needs in the short to medium term in the mer sector - In-depth analysis of the unique skills systems that exist within the segments and across the provinces/regions - Challenges in relation to the supply of labour and skills - Opportunities for effective development of skills Contrasting the training approaches, activities and benefits of training for small and informal businesses with those of larger enterprises with specific attention to different modes of training, and sources of provision	levy Payers), Strategic Programmes e.g. Co-operatives Programme, Chamber research.	

			- Understand why these labour and skills needs exist - Evaluate the appropriateness of different education and skills development practices and responses in relation to labour and skills needs identified Fundamentally, the research project should assist in further developing a sustainable skills development support strategy for these sector segments and contribute to the merSETA's Sector Skills Plan (SSP) and Strategic Plan (SP).			(public / private / workplace based, etc.)		
Project	**Topic**	**Study Design / methodology**	**Objectives**	**Data Collection Tool**	**Sample Size**	**Scope of Study**	**Data Sources Used**	**Time Frame**
Metal Chamber Research Phase 4	Benchmarking Study of Models of Training Lay-off and Retrenchment	Mixed method: qualitative and quantitative	The objectives of this research study were to: - Review the effectiveness and efficiency of the Training Layoff	Interviews Focus Groups Case study	**12 from the following organisations:** - MerSETA - Commission for Conciliation,	Explore other models of training lay-off and retrenchment mitigation schemes.	- MerSETA database 26 September.2017 - Statistics South Africa. Labour Force Survey - The Star Online - Trading Economics	June 2017 - March 2018

	Mitigation Schemes		Scheme in the metal industry - Identify similar models of retrenchment mitigation schemes successfully applied in other countries Make recommendations to either improve the current Training Layoff Scheme or replace it with a better alternative		mediation and Arbitration - Azimon Consulting - Department of Labour - Solidarity DCD Ring-rollers		- Intersectoral agreement lays basis for training system reform', European Industrial Relations Survey Online. - Auditor-General of SA. 2017. Training Layoff Scheme Value Chain Analysis. - Comparative review of unemployment and employment insurance experiences in Asia and worldwide. ILO/Japan Multi-bilateral programme. Regional office for Asia and the Pacific. ILO - Exploring the Full Use of Partnerships and a Multi-Faceted Job Saving Strategy to More Effectively Address Job Loss and Deepening Poverty. - Financial Mail. 2017. Bid to save the industry. - Government of Malaysia. 2017. Employment Insurance System Bill 2017. - Training, employment and 'employability': responding to the jobs	

							crisis' University of Birmingham, Birmingham, UK. - ILO. 2009. Protecting people, promoting jobs. A survey of country employment and social protection policy responses to the global economic crisis: An ILO Report to the G20 Leaders' Summit, Pittsburgh, 24–25 September 2009, Geneva. - ILO. 2013. A comparative review of unemployment and employment insurance experiences in Asia and worldwide. International labour Organisation. - ILO. 2015. The design of an employment insurance system for Malaysia. ILO: Bangkok. Mass, G. 2015. Supporting job-to-job transitions in Sweden. Friedrich Ebert Stiftung: Stockholm	
Project	**Topic**	**Study Design / methodology**	**Objectives**	**Data Collection Tool**	**Sample Size**	**Scope of Study**	**Data Sources Used**	**Time Frame**
Motor Chamber Research Phase 4	Investigate the relevancy of occupations	Mixed method: qualitative and quantitative	The research objective was to understand what impact the	The research methodology combines:	- Qualitative research participants (Tier 1 automotive	The scope of work has a deliberately narrow focus on two discreet elements of the motor industry value chain,	- merSETA Motor Chamber Research Reports;	June 2017 March 2018

	and skills for the motor industry		Motor Industry trends have on skills and occupations in the workplace. In doing so, to determine: - How the market and consumer trends have changed motor vehicles. - How changes in vehicle specifications have affected the maintenance and repair of vehicles. - How the changes in vehicle specifications have affected the manufacturing components for vehicles. - How operational changes in the manufacturing, maintenance and repair of motor vehicles have affected occupations.	- Desktop research - Qualitative primary research Quantitative primary research	manufacturers): 21 - Quantitative research participants (Tier 1 automotive manufacturers): 29 - Qualitative research participants (Automotive aftermarket services and support): 20 Quantitative research participants (Automotive aftermarket services and support): 45	which are covered in two separate "research streams" in the report. **Research Stream I:** Considers the skills development needs of OEM-approved vehicle component manufacturers (referred to henceforth as "Tier 1 automotive manufacturers") This research was conducted by Benchmarking and Manufacturing Analysts SA (Pty) Ltd (BMA) **Research Stream II:** This stream deals with the aftermarket services and support provided by automotive dealer and distribution establishments (referred to as "automotive aftermarket services and support") This research was conducted by the MIBC	- merSETA Sector Skills Plan - Sector Skills plans of other SETA associated to the Motor Industry - MIBCO Occupational Research Project - Automotive Supply Chain Competitiveness Initiative (ASCCI) Durban Automotive Cluster (DAC) Research Reports	

			- What skills and competencies are required to fulfil occupational roles? - What can be done to develop, reform and upskill people to become relevant? - What can be done to develop the skills that do not exist? - What implications workplace reorganisation and skills reform have on skills and labour authorities?					

New data (in terms of skills demand) is also coming from the WSS questions that we have incorporated into the WSP (hard to fill vacancies and skills gaps), and interviews with stakeholders (each chamber had been covered both employer and labour).

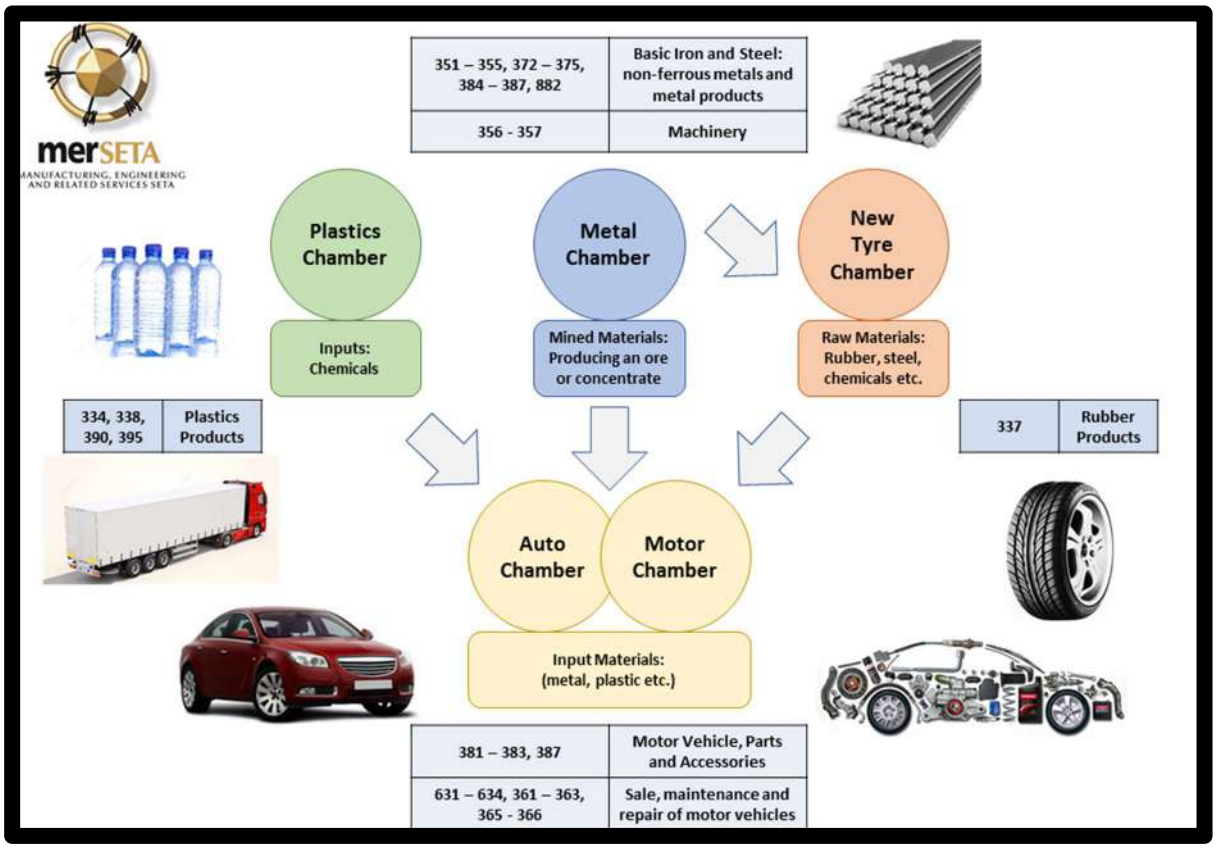
1 SECTOR PROFILE

The purpose of this chapter is to present the profile of the manufacturing, engineering and related services sector. It elaborates on the sector scope of coverage, key role players, economic performance and the profile of employers and employees. The chapter also describes the major sector characteristics that influence sector skills needs and skills development requirements.

1.1 SCOPE OF COVERAGE

The merSETA, established in terms of the skills development legislation of 1998, includes a range of manufacturing activities in addition to a few related service and retail activities. On the basis of the three-digit Standard Industrial Classification (SIC) codes used in capturing the data for the National Accounts, Figure 1 below outlines the industrial activities aligned to the merSETA scope of coverage and classifies them by Chamber. The figure depicts the interrelationships between the Chambers and demonstrates flow of inputs.

Figure 1: merSETA Scope of Coverage by SIC Code and Chamber (**SIC codes are presented in the grey boxes)



As demonstrated in Figure 1, merSETA member companies belong to one of five Chambers. This five-chamber structure does not however totally align with the National Accounts data which refers to the metal sector, the automotive sector (combining the Auto, Motor and New Tyre Chambers) and the Plastics Manufacturing Industry. Furthermore, while the majority of merSETA firms fall within the overall manufacturing sector in the National Accounts data and make up a sizeable proportion of total South African manufacturing, the merSETA also includes firms that fall into the retail with particular reference to the Motor Retail Sector which forms part of the Motor Chamber. In terms of the specific Standard Industrial Classification codes that fall into the merSETA scope of coverage, Table 1 below outlines the codes at 3 digit level, Chamber and industrial sector.

Table 1: merSETA Scope of Coverage by SIC Code, Chamber and Industrial Sector

CHAMBER	SIC	DESCRIPTION	SECTOR
Auto	**381**	**manufacture of motor vehicles**	**Manufacturing**
Metal	351	manufacture of basic iron and steel	**Manufacturing**
	352	manufacture of basic precious and non-ferrous metals	
	353	casting of metals	
	354	manufacture of structural metal products, tanks, reservoirs and steam generators	
	355	manufacture of other fabricated metal products; metalwork service activities	
	356	manufacture of general purpose machinery	
	357	manufacture of special purpose machinery	
	358	manufacture of household appliances n.e.c.	
	361	manufacture of electric motors, generators and transformers	
	362	manufacture of electricity distribution and control apparatus	
	363	manufacture of insulated wire and cable	
	365	manufacture of electric lamps and lighting equipment	
	366	manufacture of other electrical equipment n.e.c.	
	371	manufacture of electronic valves and tubes and other electronic components	
	372	manufacture of television and radio transmitters and apparatus for line telephony and line telegraphy	
	373	manufacture of television and radio receivers, sound or video recording or reproducing apparatus and associated goods	
	374	manufacture of medical appliances and instruments and appliances for measuring, checking, testing, navigating and for other purposes, except optical instruments	
	375	manufacture of optical instruments and photographic equipment	
	384	building and repairing of ships and boats	
	385	manufacture of railway and tramway locomotives and rolling stock	
	386	manufacture of aircraft and spacecraft	
	387	manufacture of transport equipment n.e.c.	
	503	building installation	**Construction**
	504	building completion	
Motor	382	manufacture of bodies (coachwork) for motor vehicles; manufacture of trailers and semi-trailers	**Manufacturing**
	383	manufacture of parts and accessories for motor vehicles and their engines	
	387	manufacture of transport equipment n.e.c.	
	631	sale of motor vehicles	**Retail**
	632	maintenance and repair of motor vehicles	
	633	sale of motor vehicle parts and accessories	
	634	sale, maintenance and repair of motor cycles and related parts and accessories	
New Tyre	337	manufacture of rubber products	**Manufacturing**
Plastics	334	manufacture of basic chemicals	**Manufacturing**
	338	manufacture of plastic products	
	395	recycling n.e.c.	

1.1.1 Industrial Overview

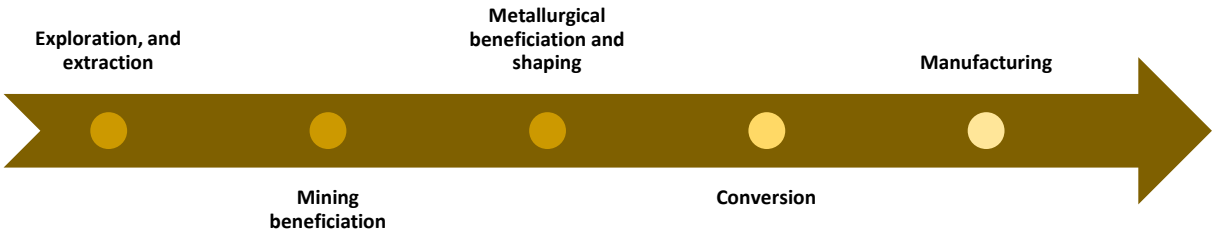
This section provides a depiction of each of merSETA sectors' industrial activities and outputs. It starts with the metals sector which comprise metal foundries, fabricators, manufacturers and recyclers making inputs into (but not limited to) the automotive sector which also draws inputs from the plastics and new tyre sectors.

Metal Sector

The metal sector, including capital equipment, foundries, transport equipment, metal fabrication (CETEMF) and related sub-sectors, form a substantial part of South Africa's manufacturing. The production of this sector is based on the county's rich natural endowment in a wide range of metals.

Foundries and metal fabricators produce the intermediate (and sometimes final) products that will be received by metal manufacturers who convert them to final products. Key markets for metal products are the auto sector and the construction industry. Metal recyclers complete and restart the cycle by returning scrap metal to the beginning of the value chain and manufacturing process to be reused in the production of new products (merSETA Supply and Demand Study, 2018). Among metal manufacturers and metal recyclers, the metals sector has some of the smallest businesses.

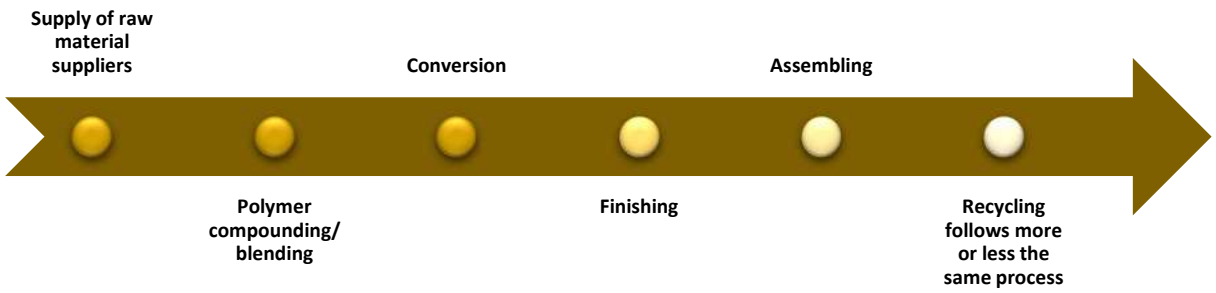
Figure 2: Metal Sector Supply Chain (Source: merSETA Supply and Demand Study, 2018)



Plastics Sector

The merSETA's plastics manufacturing sector is largely composed of small firms, as barriers to entry are relatively low (DTI, 2013). The vast majority of firms are not listed in the Johannesburg Stock Exchange (JSE) (merSETA, 2013). Local and imported polymers are converted into a range of intermediate and final products. The products form a critical input into a range of other sectors. More than half (52%) of South Africa's plastics manufacturing serves the local food and general packaging market. Other market sectors include building and construction, automotive, agriculture, medical, household goods, clothing and footwear, toys and leisure equipment.

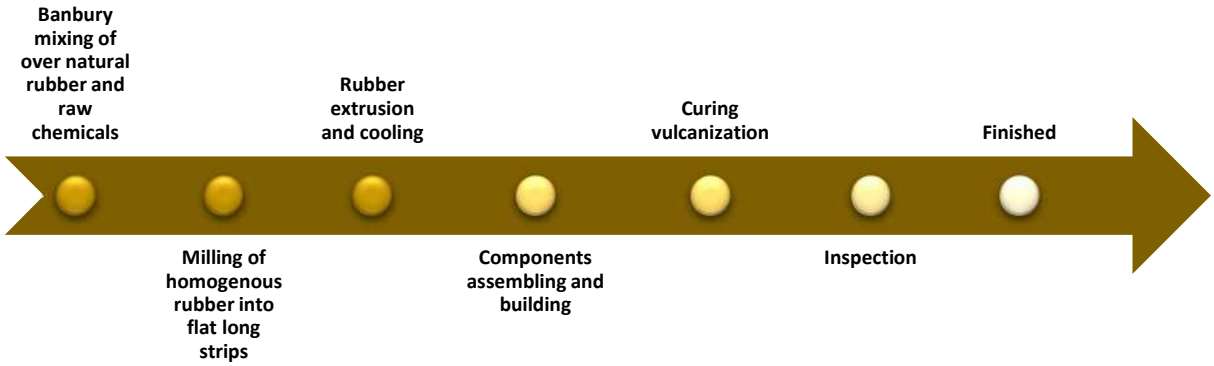
Figure 3: Plastics Sector Supply Chain (Source: merSETA Supply and Demand Study, 2018)



New Tyre Sector

The tyre sector is responsible for the production of new tyres. With just four locally based manufacturers, there are even fewer new tyre manufacturers based in South Africa than auto OEMs (merSETA Supply and Demand Study, 2018). Good Year, Bridgestone, Continental Tyres and Sumitomo Rubber are international heavyweights with production facilities in South Africa. Production of tyres is limited to 3 provinces: North West, KwaZulu-Natal and the Eastern Cape (merSETA Supply and Demand Study, 2018).

Figure 4: New Tyre Sector Value Chain (Source: merSETA Supply and Demand Study, 2018)

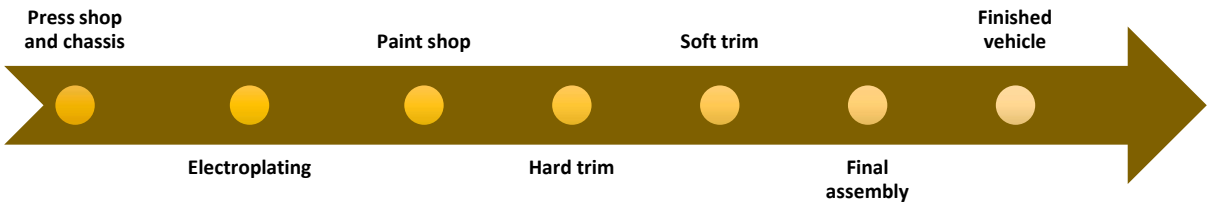


Automotive Sector

The automotive sector, incorporating Original Equipment Manufacturers (OEMs), the New Tyre Chamber and Motor Chamber, includes companies linked to each other through the automotive production and distribution value chain. The metals, plastics and rubber product sectors provide key inputs into the components manufacturing and vehicle assembly sections of the value chain.

Due to the capital requirements and technical nature of producing vehicles there are only a handful of Auto OEMs in South Africa, all of which are international brands (merSETA Supply and Demand Study, 2018). South Africa's main sites for automobile production are the Eastern Cape, specifically Port Elizabeth and East London, Gauteng, specifically Rosslyn and Silverton (Pretoria) and KwaZulu-Natal (KZN), specifically Durban (merSETA Supply and Demand Study, 2018). The Auto Sector has some of the largest scales of operation of all the sectors.

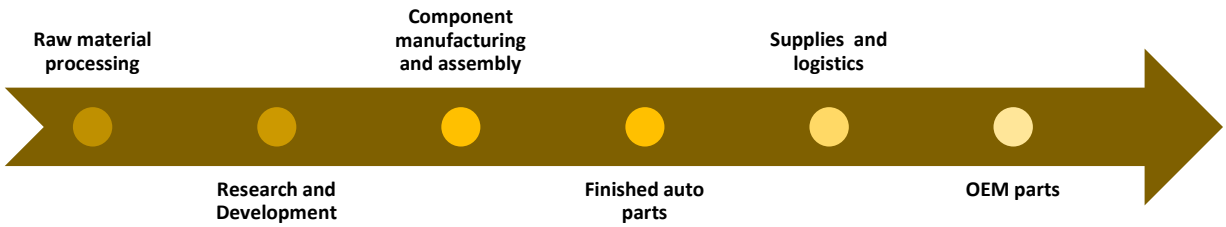
Figure 5: Automotive Sector Supply Chain (Source: merSETA Supply and Demand Study, 2018)



Motor Sector

Within the motor manufacturing sector, the only key sub-sector is component and assembly manufacturers (merSETA Supply and Demand Study, 2018). These are companies that manufacture vehicle components, parts and equipment. This sector interlinks with the auto sector as it supplies components used in the manufacture of vehicles. The sector also interlinks to motor sales and service in that the manufactured components are sold to independent parts sellers. Due to the increased resource needs and skills required to produce some components (i.e. compliance to meet the standards of Auto OEMs), major employers in this sector tend to be larger businesses. Components that are manufactured relate to various phases of the auto value chain from upstream manufacturing of casts, to downstream trimming (merSETA Supply and Demand Study, 2018).

Figure 6: Motor Sector Supply Chain (Source: merSETA Supply and Demand Study, 2018)



1.2 KEY ROLE PLAYERS

The industry is shaped primarily by government, industry and organised employers and labour. The key role players within the mer sector include industry bodies, employer associations, government departments and institutions that provide policy direction or play a regulatory role. Table 2 below briefly identifies and describes the role of these players in industry.

Table 2: Key Regulatory Organisations in the merSETA Scope of Coverage

ORGANISATION TYPE	NAME OF ORGANISATION	COLLECTIVE ROLE
Government Departments	Department of Higher Education and Training (DHET)	Government's role is to ensure adequate policies and legislation are in place to facilitate sustainable economic as well as address social issues.
	Department of Trade and Industry (DTI)	
	Department of Science and Technology (DST)	
	Department of Environmental Affairs (DEA)	
Employer Organisations	The Steel and Engineering Industries Federation of Southern Africa (SEIFSA)	Employer organisations represent members in collective bargaining, data and information gathering and skills development.
	Automobile Manufacturers Employers Organisation (AMEO)	
	Retail Motor Industry Organisation (RMI)	
	National Association of Automobile Manufacturers (NAAMSA)	
	National Association of Automotive Component and Allied Manufacturers (NAACAM)	
	Automotive Industry Export Council (AIEC)	
	The South African Tyre Manufacturers Conference (SATMC)	
	Plastics South Africa (PlasticsSA)	
Professional Organisations	Engineering Council of South Africa (ECSA)	Its core functions are the accreditation of engineering programmes, registration

ORGANISATION TYPE	NAME OF ORGANISATION	COLLECTIVE ROLE
		of persons as professionals in specified categories, and the regulation of the practice of registered persons.
Bargaining Councils	National Bargaining Forum (NBF)	The Labour Relations Act provides for the self-regulation of industries through the medium of Bargaining Councils. Bargaining Councils deal with collective agreements, solve labour disputes, establish various schemes and make proposals on labour policies and laws (DoL, 2016).
	Metal and Engineering Industries Bargaining Council (MIEBC)	
	Motor Industry Bargaining Council (MIBCO)	
	Bargaining Council for the New Tyre Manufacturing Industry	
Labour Organisations	National Union of Metalworkers South Africa (NUMSA)	Unions play a significant role in advocating and fighting for worker's rights, skills development and improving conditions of employment and advocating for transformation among other things.
	Chemical Energy Paper Printing Wood and Allied workers Union (CEPPWAWU)	
	Metal and Electrical Workers Union of South Africa (MEWUSA)	
	Solidarity	
	United Association of South Africa (UASA)	
	Motor Industry Staff Association (MISA)	

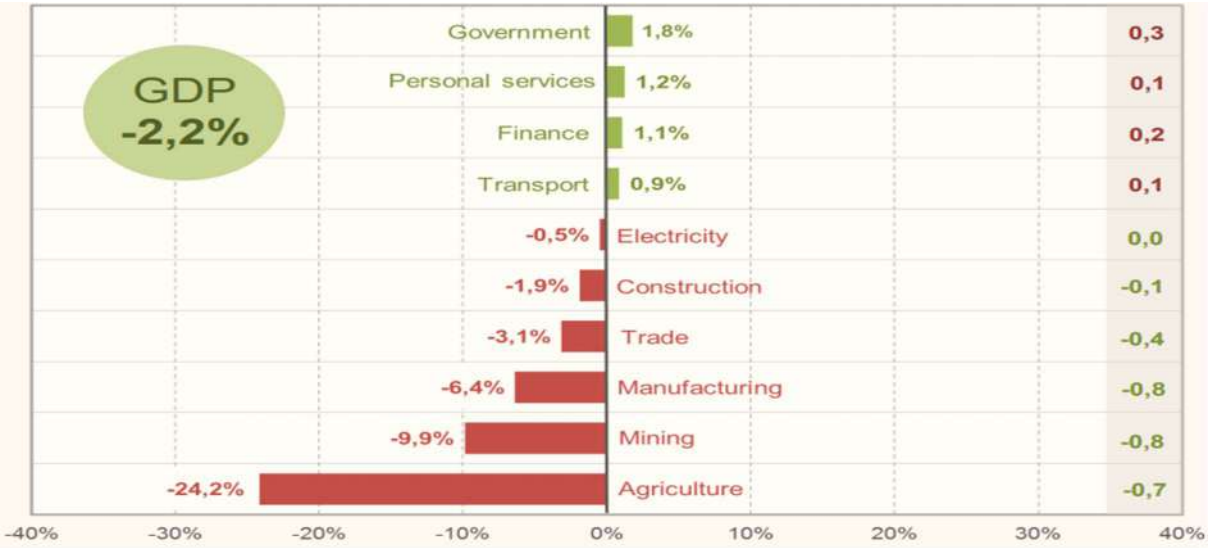
1.3 ECONOMIC PERFORMANCE

South Africa has experienced a period of protracted economic weakness, mainly as a result of domestic constraints. This is reflected in low levels of private investment, growing unemployment, and declining real per capita income in recent years (National Treasury, 2018). During the first quarter of 2017 the South African economy was categorised by numerous challenges which pulled the economy into uncertainty. These include cabinet reshuffles, allegations of state capture, the promulgated Mining Charter, the debacle with respect to the mandate of the Reserve Bank and the deterioration of the country's fiscal stance. These challenges lead to policy and political uncertainty which eroded business and consumer confidence resulting in a negative economic outlook. These factors in turn undermined the growth of the manufacturing sector and the economy in general.

Political uncertainty was one of the contributing factors to the economic decline. During this period, the proportion of manufacturers who indicated that politics is a constraint on doing business in South Africa, increased from 76% to 87% (Grocotts, 2017). Thus, business had to adopt strategies to accommodate the changing economic situation through learning to adapt to such policy environment 'shocks' (Grocotts, 2017). In June 2017, the country plunged into a technical recession with Moody's confirming South African credit rating outlook as remaining negative (Trading Economics, 2017). Political certainty and political stability remains an important factor in economic growth as it directly impacts policy certainty and governance among other factors.

In the last quarter of 2017, it was reported that the economy grew by 3.1% however this trend was reversed in the first quarter of 2018 when GDP contracted by 2.2%, the largest decline since 2009 (StatsSA, 2018). The figure below shows that the decline was due to agriculture, mining and manufacturing with the electricity, construction and trade industries also recording negative growth.

Figure 7: GDP Quarter 1, 2018 (StatsSA, 2018)



In South Africa, private investment has been contracting since 2015, mainly as a result of low levels of business and consumer confidence. Growth has remained stuck below 2% and unemployment remains high at 26.7% (National Treasury, 2018). Confidence and investment are mutually reinforcing. In February 2018, Cyril Ramaphosa was sworn in as South African's new president resulting in stocks rising as much as 5% and the rand firming to its firmest since early 2015 (BusinessTech, 2018). This in part, contributed to Moody's upgrading its South African credit outlook from negative to stable in March 2018 which prevented the country's pending credit downgrade to sub-investment grade. It was however indicated by Moody's that steady progress in meeting the objectives set out in the president's state-of-the-nation address in February 2018 was essential for the sustainability of the country's economic and fiscal prospects (BusinessTech, 2018).

Against the backdrop of a significantly improved political environment, which is impacting positively on consumer, business and investor sentiment, alongside a relatively benign inflation outlook, supportive monetary policy and more favourable prospects for the world economy, including higher commodity prices, the outlook for the South African economy has improved considerably (IDC, 2018). However, the VAT increase from 14% to 15%, effective 1 April 2018, as well as higher excise duties and the rise in the fuel levy, may limit projected economic growth (IDC, 2018). This is likely to affect consumer spending which is a key driver of economic growth.

In March 2008, South Africa's central bank cut interest rates by 25 basis points, to 6.5 % (their lowest in two years), after judging that inflation will remain low while economic growth was faster than expected (South African Reserve Bank, 2018). This is a significant development that will bolster the economy through increased consumer spending. Despite an increase in VAT, NAAMSA projected that domestic vehicle sales in 2018 are to increase as a result of reduced interest rates among other factors.

Developments in the global trading environment will be particularly important. South Africa has an open economy as indicated by the sizeable shares of GDP, at 29.8% and 28.4% respectively, claimed by exports and imports in 2017 (IDC, 2018). Therefore, South Africa is strongly affected by global trade developments, directly and indirectly. Stronger demand from South Africa's key trading partners is anticipated to result in an improved export performance

over the medium-term. Manufactured exports should benefit from increased demand in the Eurozone and Sub-Saharan African markets, among others, but may face significant challenges in the US market, as exemplified by the recently imposed tariffs on US imports of steel and aluminium (IDC, 2018). Uncertainty surrounding Brexit may affect exports and financial flows with one of South Africa's largest European trading partners. The implementation of economic reforms remain critical to facilitate faster growth and sustain the ongoing economic recovery (Focus Economics, 2018). Unemployment remains high, reflecting skill shortages and weak investment; inequalities in opportunities and incomes also remain high despite the introduction of the proposed new minimum wage (OECD, 2018). Reforms to ease the cost of doing business, boost entrepreneurship, lift competition barriers in many sectors and facilitate the expansion of firms in the neighbouring region would boost productivity and help create jobs (OECD, 2018). To increase investment in the country, President Cyril Ramaphosa is leading a drive to attract R1.2 trillion ($100 billion) in new investment into the country (MoneyWeb, 2018).

1.3.1 Manufacturing Production and Sales

Manufacturing production decreased by 3% in the first quarter of 2018 (seasonally adjusted) The reduction was due mostly to petroleum, chemicals, rubber and plastic products industries (-8,1% and contributing -2,0 percentage points) and the basic iron and steel, non-ferrous metal products, metal products and machinery division (-3,0% and contributing -0,6 of a percentage point).

When considering the mer sectors, the figures below show production and production growth, we highlight the growth in production by the merSETA sub-sectors in the last 11 years (2007-2018) with 2007 as the base year. The figures show that the metals and motor sectors (as described by standard industrial classification in the merSETA scope of coverage) produce high volumes compared to the other sectors, however in terms of production growth, the plastics sector has fared well over time although showing slight decline by the need of the third quarter of 2018. The motor and tyre sectors (automotive components) sectors seem to be on an upward trend with the auto sector (auto assembly) showing slowed growth by the end of the third quarter of 2018.

Figure 8: mer Sector Production 2007 - 2018 (own calculations based on StatsSA data, Production and Sales, 2018)

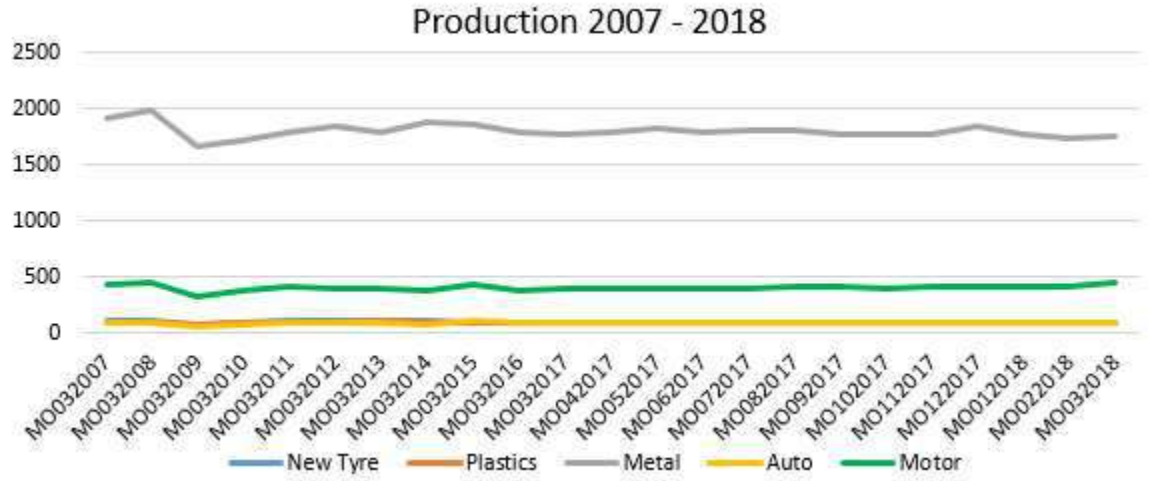
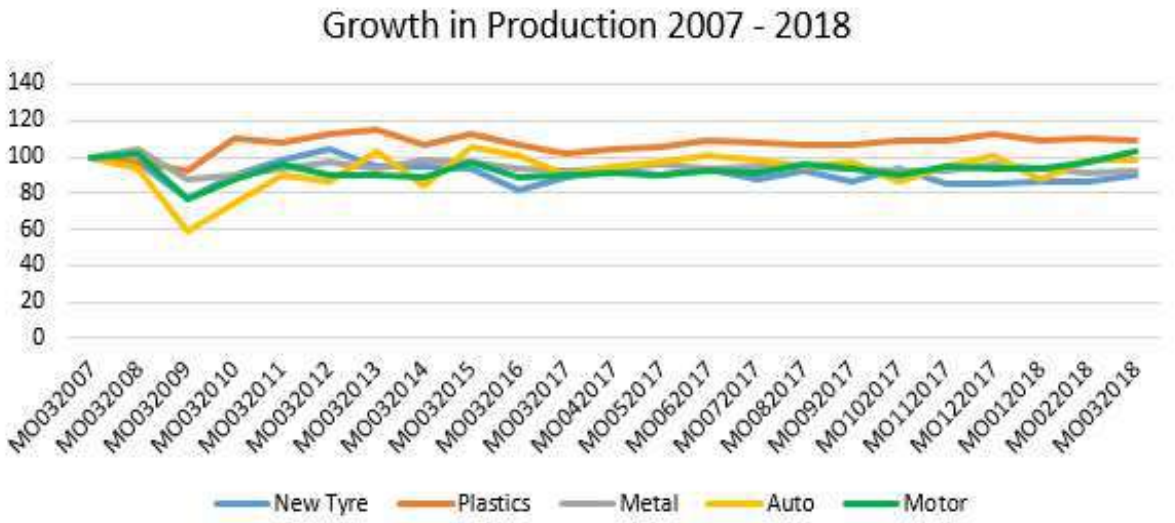


Figure 9: mer Sector Production Growth 2007 - 2018 (own calculations based on StatsSA data, Production and Sales, 2018)



Sales growth is a key indicator of economic performance. In considering sales growth, we highlight the growth in sales (Rands) of products produced by the merSETA sub-sectors in the last 11 years (2007-2018) with 2007 as the base year. The sales figures as shown below show a similar pattern with the metal, auto and motor sectors selling high volumes (sales), but metal and auto sales growth has slowed with plastics, motor and tyre sectors faring well in terms of sales growth over time.

Figure 10: mer Sector Sales 2007 - 2018 (own calculations based on StatsSA data Production and Sales, 2018)

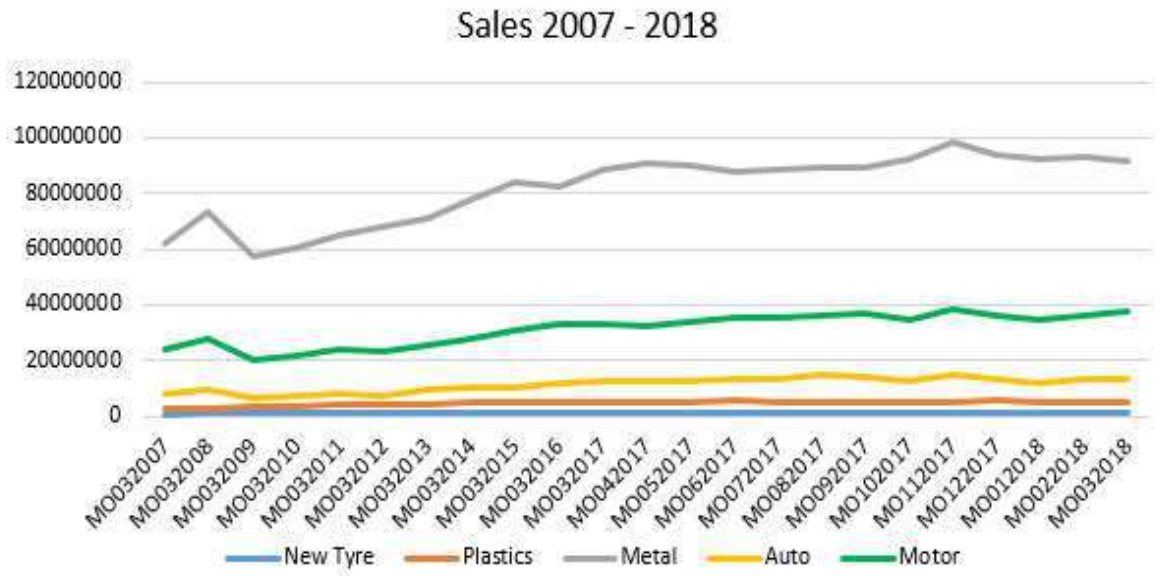
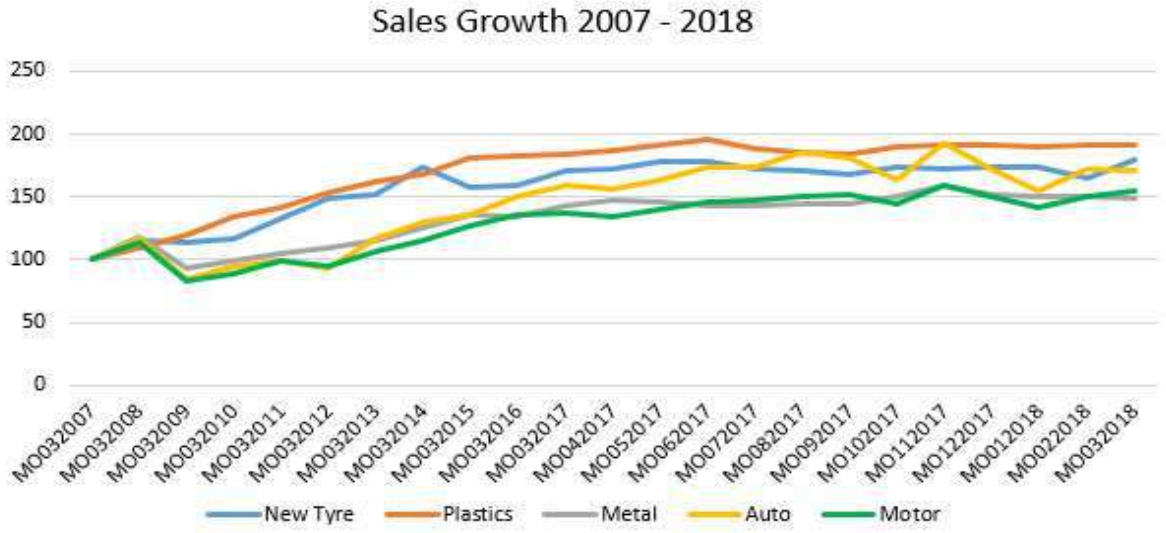


Figure 11: mer Sector Sales Growth 2007 - 2018 (own calculations based on StatsSA data Production and Sales, 2018)



The manufacturing sector remains a priority sector that has been earmarked for growth as reflected in government policies such as the NDP and IPAP. Despite being arguably one of the strongest manufacturing bases in Africa, challenges remain. Speaking during a briefing to Parliament's Portfolio Committee on Trade and Industry on the state of manufacturing, World Trade Organisation and the Industrial Policy Action Plan (IPAP), Trade and Industry Minister Rob Davis indicated that the decline in the manufacturing sector over the years has been attributed to digital production and changes in manufacturing technologies (DTI, 2017). Minister Rob Davis also reiterated that to grow the manufacturing sector, a domestic and "tightly coordinated" supportive environment premised on policy and programmatic certainty needs to be developed (DTI, 2017). Policy innovation is therefore important in the wake of fast paced changes that have disrupted every sector.

1.3.2 Economic Performance of Each Economic Sector

In the next sub-sections we explore the economic performance of each sub-sector that belongs to the merSETA scope of coverage.

Automotive Sector

Despite the political and economic uncertainty in the country during 2017, the automotive sector ended the year on a positive note (WesBank, 2018). Vehicle and component production (with the auto sector the largest manufacturing sector in the country) accounted for 30.1% of South Africa's manufacturing output (Engineering News, 2018). The broader automotive industry's contribution to the country's GDP in 2017 was 6,9% (4.4% manufacturing and 2.5% retail) down from 7.4% in 2016 (Engineering News, 2018a). Considering that vehicle and component manufacturing comprises nearly a third of the country's manufacturing output, the automotive industry supported by the merSETA, is and will remain essential to the growth and success of the South African economy. Key developments in the automotive sector in 2017 include:

- Total industry employment at the end of December 2017 totalled 29 808 reflecting an increase of 275 jobs (gain of 0.93%) compared to the 29 533 industry head count at the end of September 2017 (NAAMSA, 2018).

- Record total investment by the major vehicle manufacturers in 2017 amounted to R8.17 billion (NAAMSA, 2018).
- South African vehicle production decreased to 592 145 vehicles in 2017 from 600 008 units produced in 2016 – a fall of 1.3% (NAAMSA, 2018).
- South Africa's share of global new vehicle production declined to 0.61% in 2017, down from 0.63% in 2016 (NAAMSA, 2018).
- Total industry new car sales for quarter four of 2017 was 94721 units, an improvement of 5497 units (gain of 6.2%) compared to the 89224 new cars sold during the corresponding quarter of 2016. Domestic new vehicle sales showed improvement, year on year, whilst export sales were lower (NAAMSA, 2018).

As South Africa managed to avoid a further downgrade at the end of the first quarter of 2018, NAAMSA anticipates that economic growth could recover to a level above 1.5% in 2018 with new vehicle sales possibly expanding between 2% and 4% (NAAMSA, 2018). Industry new vehicle exports will remain a function of the performance and direction of global markets. Indications for the global economy are reasonably positive with the latest International Monetary Fund (IMF) projections anticipating global growth at around 3.7% which should benefit vehicle exports to Europe, Australasia and Asia. NAAMSA anticipates that export sales could see a modest growth during 2018; currently, an increase of around 11% (a total of 366 050) export sales are anticipated for 2018 (NAAMSA, 2018; IMF, 2018). A central development in the auto sector was the announcement of Mercedes Benz that it will invest R10 billion (€600 million) into the expansion of the East London plant in South Africa (IOL, 2018). This will create greater demand several supplier industries, stimulating new investment and job creation emphasising a commitment to revive economic growth in the country (IOL, 2018).

Motor Sector

According to Dr Azar Jammine, Director and Chief Economist at Econometrix, the South African motor industry is holding up surprisingly well in a tough economic environment that is being aggravated by political turmoil (RMI, 2018a). He also noted that although the country was technically in a recession, with negative growth for two consecutive quarters, there were some positive points in the local economy with the motor industry being one of them. Encouraging factors for the industry include the rise in the demand for electricity, a lower-than-expected inflation rate, vehicle price increases slowing, the price of fuel falling, a big improvement in the motor industry trade balance and a brighter outlook for the global economy (Wheels24, 2018).

Although the positive sentiments about the South African economy will impact the automotive industry, it will take time to generate material growth. However, new vehicle sales are expected to see moderate growth in 2018 according to WesBank's CEO. South Africa's economic challenges are structural in nature, and will take an extended period of time to correct, however the positive sentiment brought about by the recent political changes is a good place to start and will lead to greater economic investment and improved growth prospects for the country (RMI, 2018b).

Plastics Sector

The South African plastics industry employing around 60 000 people, contributes approximately 1.9% to South Africa's GDP and approximately 16.5% of the manufacturing sector (IPAP, 2017). The sector is well developed throughout the plastics value chain from upstream to downstream beneficiation producing input materials and value added products for both local demand and export markets (DTI presentation, 2016). Generally, the leading markets for plastics are in packaging, building, construction and the automotive industries. However, a number of other industries which use some form of plastics are textile, electrical, electronic, mechanical engineering, and agricultural industries (ProductivitySA, 2017).

The increase in the use of plastic products across all sectors including the manufacturing sector presenting an opportunity for the growth of the sector. This has led government to define the sector as a priority sector. This, coupled with an increased demand and use of products containing plastics as well as an increased demand for plastic applications by South Africa's growing middle-class, has a positive impact on the industry (PlasticsSA, 2017).

Challenges experienced by the sector include the lack of advanced manufacturing practices and the slow technological upgrading, skills shortages and the lack of downstream focus on R&D efforts. The plastics sector is currently viewed rather negatively owing to its link to pollution, litter and marine issues. As plastic waste management is a critical issue globally, the sector will have to innovate and adapt if it is to survive this negative wave (Engineering News, 2018b). This links to the newly emphasised "circular economy" which should become the plastics industry's new roadmap to sustainable growth (merSETA Supply and Demand Study, 2018). Previously sustainability growth was limited to recycling waste and its methods, however with a circular economy emphasis, the focus is on adapting products and processes before plastic even becomes waste.

Furthermore, the competitiveness of the local industry has been negatively impacted by factors such as the cost of polymers, proximity to markets, relatively small local and regional market, and electricity pricing as well as inland location of production facilities in the case of exports. The competitive landscape is also changing dramatically with international players establishing themselves in the South African market (as is evidenced by the disposal of Astrapak to RPC plc, Boxmore to Alpla, and Nampak Flexibles to Amcor and Afripack to Constantia Flexibles). Therefore, a number of local players are now looking to position and strengthen themselves as this situation is expected to continue.

Metals Sector

The metals sector remains the biggest sub-sector in the manufacturing sector and contributes close to 30% to the manufacturing GDP. The metals sector which has been in decline for three consecutive years, is confident for 1,1% growth in 2018 following an impressive 2,7% growth in 2017 (SEIFSA, 2018). It was reported that production in the metals sector slowed down to 19.3 % in December 2017 on a month-on-month basis, when compared to the 1.0% recorded in November 2017. However, this poor month-to-month performance of the metals sector in December 2017 is inconsistent with the general growth in the annual production recorded by the entire metals sector for the full year of 2017. Companies in the sector have yet to benefit from the improved annual production recorded in 2017 as challenges prevalent to the sector

still remain. Some of these include under-utilisation of capacity, high unit labour costs and low productivity levels, which negatively impact on margins and net operating surplus levels (SEIFSA, 2018).

Despite the favourable global growth outlook, constrained domestic conditions did not help sustain the growth the metals production experienced in November 2017 (SEIFSA, 2018). However, generally 2017 was a much better year for the metals sector which rebounded from the recession in preceding years, despite facing serious structural challenges. The establishment of a Steel Development Fund is also assisting the sector. Despite the current potential to improve on margins in the metals sector being fragile due to domestic headwinds, all indications are that the sector will record another increase in growth during 2018, without major disruptions to production. Commodity prices in 2018 are expected to gain momentum due to the recovery in 2017 thereby strengthening exports and improving growth prospects for commodity exporters in emerging markets.

New Tyre Sector

The new tyre industry in South Africa benefits from South Africa's well developed automotive sector. According to data from SATMC, in 2015 11 million new tyres were sold locally, accounting for 61% of sales (SATMC, 2017). Although the industry has the capacity to manufacture 18 million tyres per annum, only 11 million tyres are manufactured locally, while 2 million locally manufactured tyres are exported mainly to SADC countries (African Business Information, 2017). The sector has over the past few years been stimulated by a R4-billion collective investment injection toward enhancing tyre production facilities (African Business Information, 2017). This in turn has led to significant strides made by manufacturers in remodelling production processes to improve capacity and to ensure adherence to stringent safety requirements. The tyre industry is worth approximately R30-billion per annum and is one of the key supporting industries for the domestic automotive industry therefore, the recent economic challenges that have not spared the automotive sector are likely continue affecting the new tyre sector due to its dependence on the automotive sector (African Business Information, 2017).

The new tyre industry continues to face stiff global competition from approximately 200 importers of various tyre brands, with about half shipped in from the Far East. This brings with it challenges such as the selling of unsafe new and used tyres to the public and the unregulated importation of such tyres (Wheels24, 2018).

1.4 EMPLOYER PROFILE

WSP data collected up to the end of May 2018 yielded 4469 companies, these include levy exempt companies, but it excludes entities that operate as training providers, non-profit organisations, universities and TVET colleges, the sample therefore represents a majority of levy paying employers who operate in the mer sectors as manufacturers, retailers and service providers. The number of employees were weighted such that they represent the profile of all levy paying companies by sub-sector (the procedure used to weight the data is explained in the research annexure attached to this document).

In terms of the size of companies in the merSETA sector, most are small and medium, when combined they employ 32% of all employees whilst large companies account for around 68% of employment.

Table 3: merSETA Companies by Size (merSETA WSP, 2018)

COMPANY SIZE	NO. COMPANIES	% SHARE COMPANIES	EMPLOYMENT	% SHARE EMPLOYMENT
Large (150+)	1057	23.65%	539211	67.91%
Medium(50-149)	2513	56.23%	229111	28.86%
Small (<50)	899	20.12%	25671	3.23%
Grand Total	**4469**	**100.00%**	**793993**	**100.00%**

The table below shows the composition of the mer sectors in terms of number and size of company as well as number of employees. Of all the merSETA sectors (barring the unknown chamber – this is reflected in the data where a company has not provided a SIC code), the motor sector shows the greatest share of employment among small and medium enterprises, comprising 37% of total employment for the sub-sector, followed by the metal chamber which comprises 33% and the plastics chamber at 22%. The auto and new tyre chambers comprise mostly of large companies, however the auto sectors which is mostly OEMs does reflect two medium sized company in the data.[1] The new tyre Chamber also shows the presence of a small company which manufactures rubber products.

Table 4: merSETA Companies by Size and Chamber (merSETA WSP, 2018)

CHAMBER	SIZE OF COMPANY	NO. OF COMPANIES	% COMPANIES	NO. OF EMPLOYEES	% EMPLOYEES
Auto	Large	7	77.78%	20452	98.91%
	Medium	2	22.22%	226	1.09%
Auto Total		**9**	**0.20%**	**20678**	**2.60%**
Metal	Large	543	22.50%	283734	66.99%
	Medium	1370	56.78%	124071	29.29%
	Small	500	20.72%	15726	3.71%
Metal Total		**2413**	**53.99%**	**423530**	**53.34%**
Motor	Large	337	20.64%	165764	63.29%
	Medium	969	59.34%	87697	33.49%
	Small	327	20.02%	8437	3.22%
Motor Total		**1633**	**36.54%**	**261898**	**32.98%**
New Tyre	Large	5	71.43%	6381	98.46%
	Medium	1	14.29%	74	1.14%
	Small	1	14.29%	26	0.41%
New Tyre Total		**7**	**0.16%**	**6481**	**0.82%**
Plastics	Large	166	45.60%	62882	78.18%
	Medium	166	45.60%	16627	20.67%
	Small	32	8.79%	928	1.15%
Plastics Total		**364**	**8.14%**	**80437**	**10.13%**
Unknown	Medium	5	11.63%	417	43.03%
	Small	38	88.37%	552	56.97%
Unknown Total		**43**	**0.96%**	**969**	**0.12%**
Grand Total		**4469**	**100.00%**	**793993**	**100.00%**

The data presented above shows that indeed the number of small and medium sized companies has increased over time and that the share of employees in these companies is also increasing with time. These organisations are providing employment for an ever increasing number of people (more than a third of employees), however these companies need support in order to be sustainable in the long-term. Government has prioritised entrepreneurship and the advancement of small, medium and micro-sized enterprises

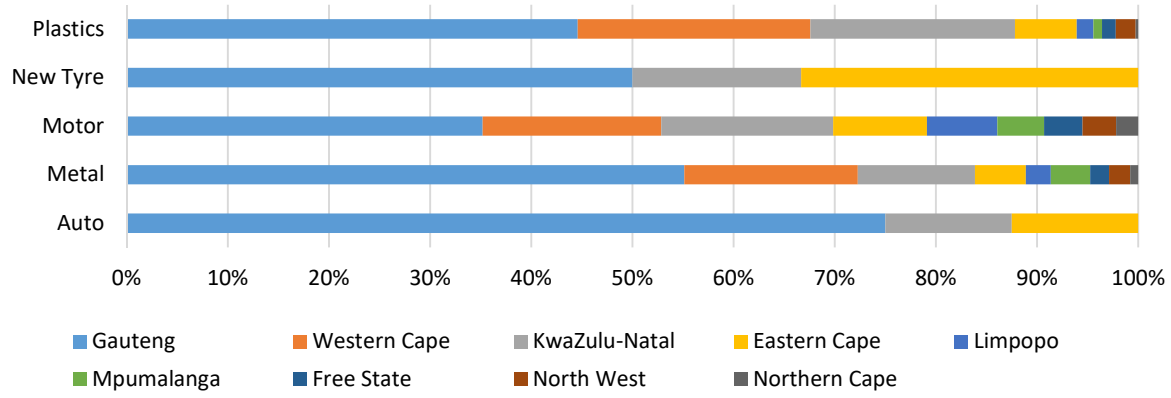
[1] Since these companies only contribute 1% further investigation is needed to determine if they do indeed belong to the chamber – one manufactures defence vehicles the defence industry and the other manufactures trucks. The total auto chamber should comprise about 30 000 employees (as confirmed by stakeholders), however one of the larger OEMs seem to have data missing in the current data set which should also be followed up before the next SSP update.

(SMMEs) as the catalyst to achieving economic growth and development. Smaller enterprises including co-operatives and informal enterprises are a vibrant source of employment. Big business is demonstrating jobless economic growth in the formal sector and therefore efforts to support these entities would be brought to scale particularly within township and rural communities.

1.4.1 Provincial Distribution of merSETA Companies

In terms of the provincial distribution of the companies within merSETA's five Chambers as seen in Figure 12, most are concentrated in Gauteng, the Western Cape, KwaZulu-Natal and the Eastern Cape. The metal sector also has a footprint in the Northern Cape and Mpumalanga. The motor sector shows a footprint in all other provinces as do the other sectors, but to a lesser degree.

Figure 12: merSETA Companies by Chamber and Province (merSETA WSP, 2018)



1.5 LABOUR MARKET PROFILE

Data submitted to the merSETA in WSPs by 4469 companies represents the majority of employees in the mer sector. If we compare the QLF data which represents 1 015000 employees[2] with that of the weighted WSP data representing 793 993, merSETA data represents 78% of employees in the formal sector. In total, the WSP data (un-weighted) represents 50000 fewer employees than what was represented in 2017. Statistics South Africa postulates that the total manufacturing sector comprises 1.85 million employees, therefore merSETA WSP accounts for 42% of all workers in the manufacturing sector. It can thus be hypothesised that the WSP is representative of the state of the sector.[3]

The manufacturing sector (under the merSETA scope of coverage in the QLFS data set), provided employment for about 1.015 million people (both formal and informal) or 6% of the total employed population which is less than what was reported last year (7.5%), this proportion has decreased year on year indicating that gains in employment in other sectors outweigh those in the mer sectors. The largest employment is within the metals sector, employing 53% (previously 62%) of all mer sector employees, the motor sector accounts for

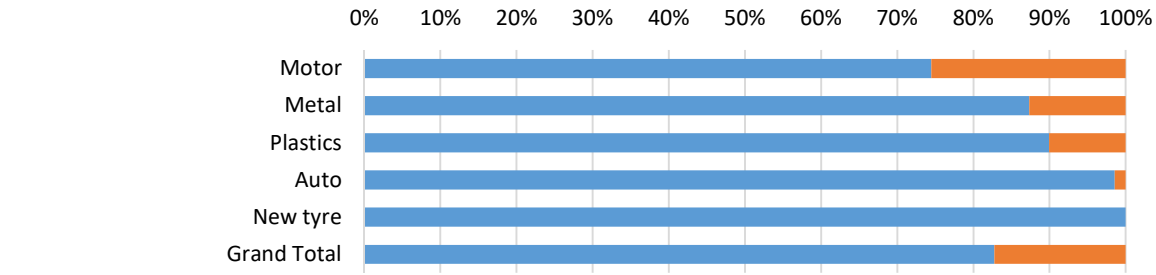
[2] This is based on our own calculations using the StatSA data set for QLFS q4 2018 (we isolated the mer sic codes) – this is merely indicative of the sector size as sample sizes are too small to be a true reflection of the total population but it does serve as an indication of the size of the sector based on data other than the WSP data.

[3] While the validity and reliability of the reported data in the WSP is viewed by some with speculation, this data set is by far the most detailed sector based data available to the labour market.

33% (previously 29%) employment, plastics and rubber products represents 11% (previously 7%) of employees, and auto 3% (previously 3%).

In terms of the formal and informal employment split within the merSETA scope of coverage, overall 83% are formally employed with 17% employed informally (merSETA calculations, StatsSA QLFS, 2018). This represents an increase from 5% in formal employment since last year which represents a gain in formal work in the sectors since we reported that formal employment decreased 6% in 2017. Figure 13 below shows that across all sectors, most employees are in formal employment, with the motor sector representing the largest proportion of informal workers (26%). This is followed by the metal sector which comprises 13% informal workers. There were no substantial data on any informal workers in the auto and new tyre sectors.

Figure 13: Formal and Informal Employment (merSETA calculations; StatsSA, 2017Q4)

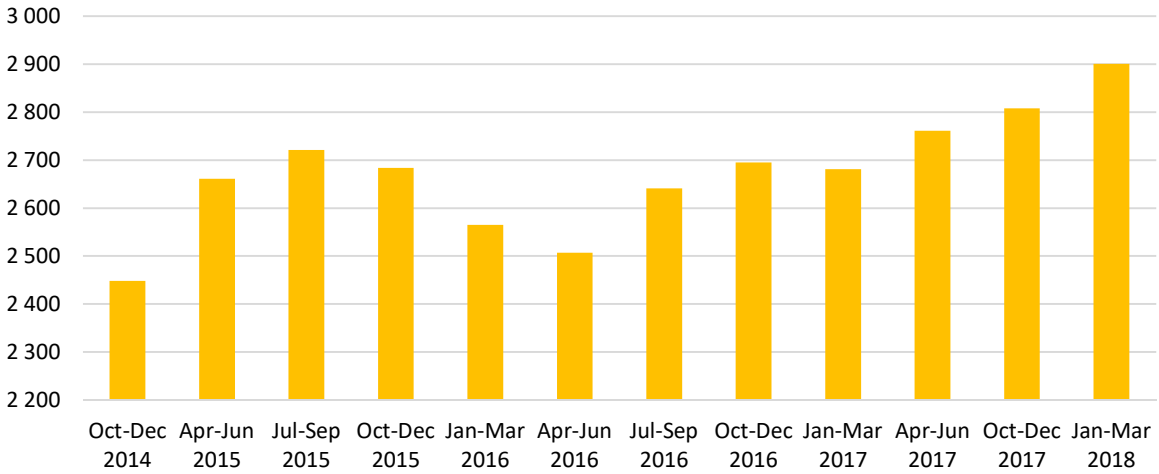


	Grand Total	New tyre	Auto	Plastics	Metal	Motor
Formal sector (non-agricultural)	840242	18124	41738	88880	366864	324635
Informal sector (non-agricultural)	174941		610	9921	53220	111190

1.5.1 Size and Contribution of the Informal Sector

According to the first quarter 2018 Quarterly Labour Force Survey statistics, 2 901 000 South Africans work in the informal sector (StatsSA, 2018). Although far smaller than South Africa's developing country counterparts, this still represents 13% of total employment in the country (StatsSA, 2018). Although individual incomes are low in the informal sector, the sector contributes an estimated 5.2% to the gross domestic product (StatsSA, 2015).

Figure 14: Informal Employment (StatsSA, 2018)



Informality within the merSETA scope of coverage is found in industries such as motor, plastics and metals. Within the plastics and metals industry, an important informal activity is the recycling of goods. The sector has collectors or sorters of recyclable material with dominant recyclable products being metal and plastic. In addition to recycling, there are various informal activities that form part of informal enterprises in the mer sectors such as welding, motor mechanics, motor panel beaters, auto electricians, auto air conditioner repairers, etc. Workers were mostly youth, most do not have qualifications beyond NQF3.

The merSETA should therefore look into strategies to support skills development on the informal sector especially with regard to types of work undertaken which requires strict health and safety precautions. Uplifting these enterprises with the support of the formal sector can also present alternate means of accessing livelihoods which over time can support a vibrant local economy.

1.5.2 Provincial Distribution of Employees

The geographical distribution of employees is likely to follow the geographical distribution of the sector as a whole, with employment concentrated in Gauteng, KwaZulu-Natal, the Western Cape and Eastern Cape. When considering the more rural regions, there are higher concentrations of employment in the motor retail, motor service and repairs, and metal fabrication sub-sectors than in the other merSETA sub-sectors. Table 5 below reflects this scenario.

Table 5: merSETA Provincial Distribution of Employees (WSP data, 2018-incomplete)

Province	Total Employed	Total Employed %
Gauteng	420859	53.01%
KwaZulu-Natal	114551	14.43%
Western Cape	99050	12.47%
Eastern Cape	53802	6.78%
Limpopo	43206	5.44%
Mpumalanga	23473	2.96%
Free State	19262	2.43%
North West	13419	1.69%
Northern Cape	6371	0.80%
Grand Total	**793993**	**100.00%**

1.5.3 Workforce by Occupational Category and Chamber

Overall, the manufacturing, engineering and related services sector comprises a majority of semi-skilled and skilled workers[4]. Over 40% of workers are skilled across all chambers and just over a quarter (27%) is employed at technician level or higher as demonstrated in Table 6 below.

[4] Skilled workers refer to managers, professionals, technicians, clerical and sales workers. Semi-skilled workers refers to craft and trader workers and operators. Low skilled workers refer to elementary occupations and domestic work (STATSSA)

Table 6: Occupational Categories of employees by Chamber (merSETA WSP, 2018)

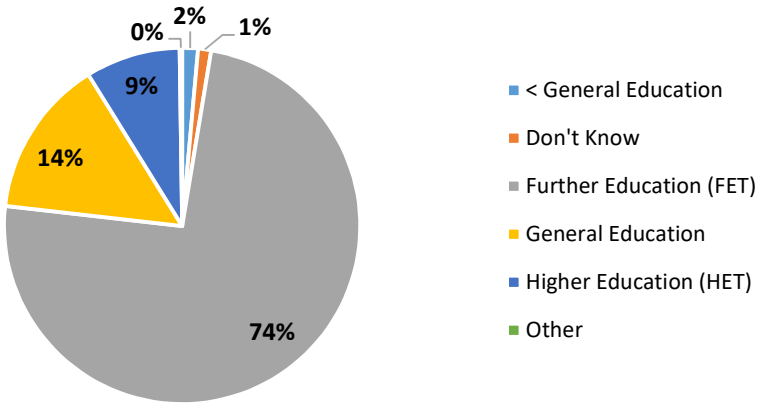
Employment Categories	Chambers					
	Auto	Metal	Motor	Plastics	New Tyre	Total
Managers	6%	10%	12%	8%	8%	10%
Professionals	4%	6%	5%	7%	3%	5%
Technicians and Associate Professionals	27%	12%	7%	13%	7%	10%
Clerical Support Workers	9%	9%	12%	4%	7%	9%
Service and Sales Workers	5%	3%	10%	2%	3%	5%
Skilled Craft and Trades	10%	24%	20%	8%	11%	21%
Plant & Machine Operators and Assemblers	17%	18%	13%	56%	31%	18%
Elementary Occupations	21%	19%	22%	3%	29%	21%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

The majority of employees in the mer sector are trades workers, and significantly close to a quarter (23%) find themselves at either elementary or operator level. In the new tyre and plastics sectors, just short of 60% of workers are at this level. The plastics sector have just recently implemented the plastics machine setter as a trade at level 6 on the OFO, however in the trades currently offered, none are really geared towards plastics processing as most of the subject matter covered in the trades relate to the larger engineering sectors and not plastics. Finding people with plastics processing knowledge is not easy as the only way to get this is from experience.

1.5.4 Educational Profile

There is no detailed information available on the skills levels of employees from merSETA WSP data. However, the QLFS Q4 2017 data from StatsSA were utilised to establish a proxy measure for educational levels of merSETA sector employees. According to 2017 Q4 QLFS data (see Figure 15 and Table 7), the majority of employees have an NQF level 4 (45%), but overall 74% of employees have FET band qualifications with 9% having qualifications higher than FET level. This has increased by 4% which may indicate efforts to improve throughput rates at HEIs, this will be explored in greater depth in chapter three of this report. A substantial 14% of employees only have general education which presents an opportunity for upskilling through the community colleges, an area that requires greater efforts going forward.

Figure 15: Highest Level of Education Attained by merSETA Employees (merSETA calculations -Stats SA, 2017Q4)



The data also shows that women tend to be less represented above NQF 4, however from the data it would seem that women who do progress beyond NQF 4 predominately attain NQF 6 (Table 7). Overall, a higher proportion of women (62%) reach NQF 4 as opposed men (47%).

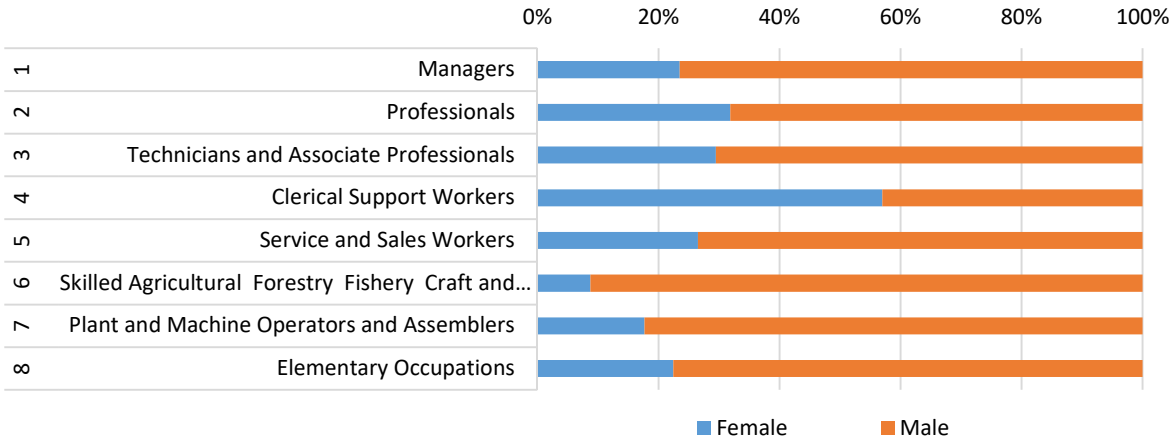
Table 7: Educational Levels of Employers in merSETA Scope of Coverage (merSETA calculations- StatsSA, 2017)

NQF LEVEL	GENDER				TOTAL	
	MALE		FEMALE			
less than level 1	11871	1%	2792	2%	8668	2%
NQF 1	132809	16%	13204	8%	175002	10%
NQF 2	108955	13%	12948	7%	167270	10%
NQF 3	110414	13%	20406	12%	176573	27%
NQF 4	391570	47%	108734	62%	603576	45%
NQF 5	13099	2%		0%	12489	0%
NQF 6	41517	5%	17157	10%	10679	1%
NQF 7	3096	0%		0%	45549	2%
NQF 8	8261	1%	50	0%	7643	1%
NQF 9	4209	1%		0%	16913	2%
DK	2287	0%		0%	5849	1%
Total	**839892**		**175291**		**1015183**	

1.5.5 Race and Gender Distribution of Employees

Race and gender are important indicators of transformation in the sector. merSETA's sectors are male dominated with 76.4% males and 23.6% females representing the gender profile of the sector. As can be seen in the figure below, the group of clerical support workers is the only occupational category in which women dominate. For the other major occupational categories, the proportion of male employees is greater among professionals, sales workers and technicians. The proportion of female workers in managerial positions remain relatively low at just over 20%, however in terms of professionals women represent 32% of employees, with technicians and associate professionals as well as sales workers also showing that women represent about a third of the of work force at these levels.

Figure 16: Gender Distribution of Employees According to Occupational Groups (merSETA WSP, 2018)



In terms of race, the sector does not reflect the demographics of the country in which Black African represent 77% of the population, Whites, 9% and Black Coloured, 9% and Black Indian/Asisan representing less than 3%. In the merSETA data, a total of 58% of merSETA employees are Black African[5] and almost a quarter (24%) are White. Black Indians/Asians

[5] For the purposes of representing equity groups (race) the merSETA use Black African, Black Coloured and Back Indian/Asian and White in order to distinguish between Black (as defined in the Employment Equity Act.) and White race groups.

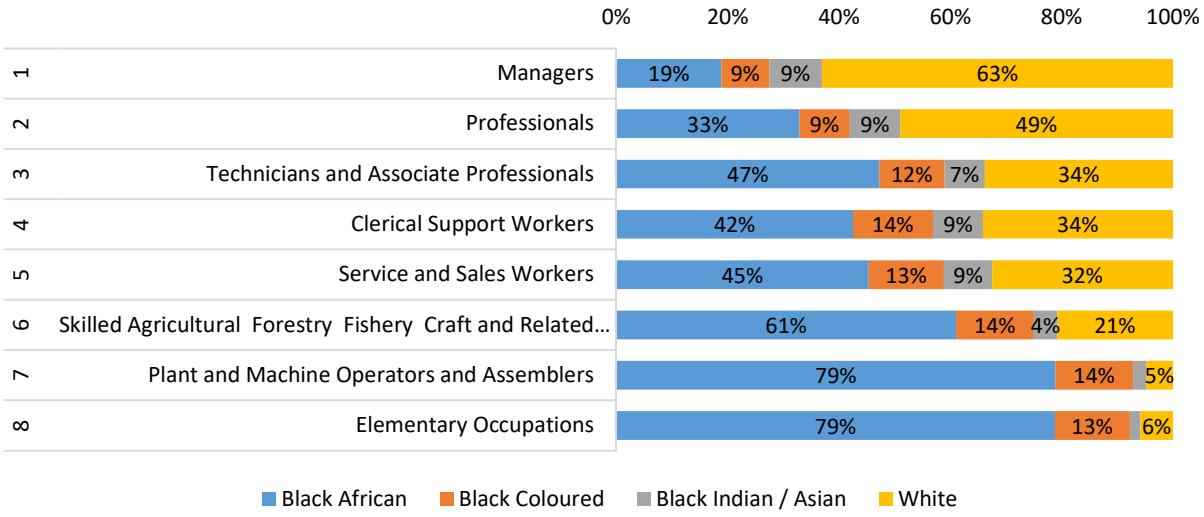
constitute 5%, while Black Coloureds constitute 13%. The sector thus demonstrates overrepresentation of White people.

Table 8: Gender Distribution of merSETA Employees (merSETA WSP, 2018)

RACE	FREQUENCY	%
Black African	459250	58%
White	188648	24%
Black Coloured	101235	13%
Black Indian / Asian	42137	5%
Other/ Unknown	2723	0%
Grand Total	**793993**	**100%**

The data as reflected in Figure 17 below, also reveals that transformation in the sector has not been progressive with previously disadvantaged racial groups still occupying lower occupational categories. White employees form the largest racial group in the occupational categories of managers (63%, this was 66% in 2017 and 67% in 2012 which shows slow transformation) and professionals (49%, this was 53% in 2017 and 57% in 2012 which shows some improvement with respect to transformation). Black African employees make up the majority of workers for technician and associate professionals (47% in 2018 and 2017), service and sales workers (45% in 2018 and 40% in 2017) and clerical support workers (42% in 2018 and 40% in 2017). Overall, there is somewhat of an improvement in the representation of Black Africans workers at higher occupational levels, but much still needs to be done to see greater improvements.

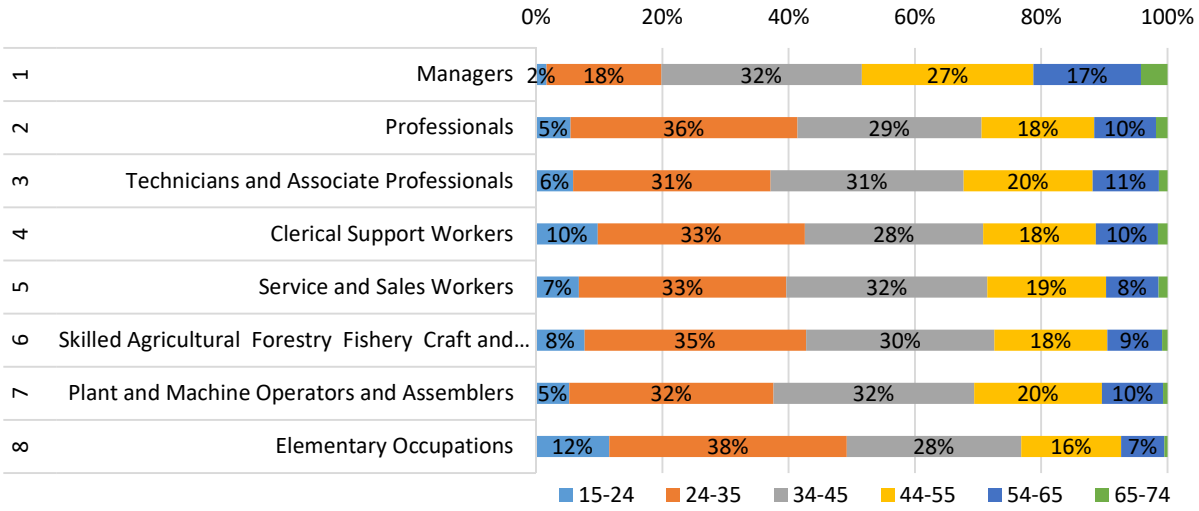
Figure 17: Racial Distribution of Employees (merSETA WSP, 2018)



1.5.6 Age Distribution of Employees

merSETA is a youthful sector; in 2017 and 2018 around 41% of all employees were younger than 35 years and only 11% were older than 55 (Figure 18 below). However, 2018 data similar to 2017 data, indicates fewer number of youth in the sector and a slight decline in employees overall, the sectors need to improve efforts to employ youth. Elementary occupations have a relatively large proportion of workers younger than 35 years (51%). This group is to a larger extent composed of semi-skilled people with basic entry level qualifications (grade 12). The highest proportion of those at managerial or professional level, are aged over 35. This is due to the positive correlation between age, skill and experience.

Figure 18: Age Distribution of Employees (merSETA WSP, 2018)



1.5.7 Disability

According to merSETA WSP data, merSETA organisations employ approximately 7429 disabled people which is a significant 60% increase since last year (4626 un-weighted data), this however represents less than 2% of the work force.

People with disabilities tend to be employed as clerical workers (19%), machine operators (15%) and artisans (17%). The metal and motor industries employ more disabled workers than other sectors. This could be attributed to the higher number of large companies with higher numbers of positions (offering a variety of work tasks) available for the disabled.

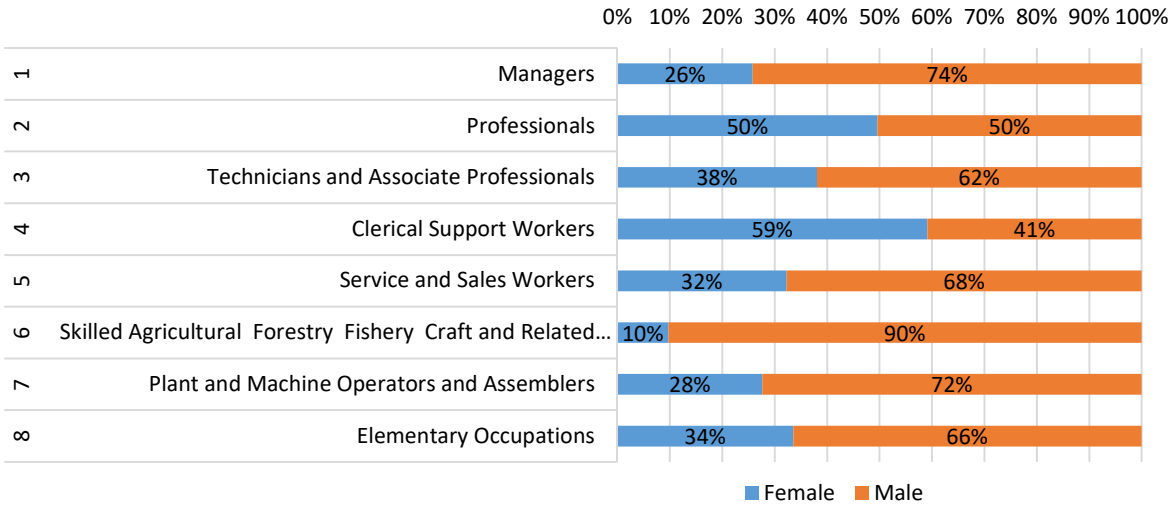
Table 9: Employees with Disabilities by Occupational Group and Chamber (merSETA WSP, 2018)[6]

OCCUPATIONAL GROUP	AUTO		METALS		MOTOR		NEW TYRE		PLASTICS		TOTAL	
Managers	34	8%	369	9%	219	9%	4	4%	45	9%	671	9%
Professionals	10	2%	277	7%	205	9%	1	1%	20	4%	513	7%
Technicians and Associate Professionals	72	17%	528	13%	189	8%	10	11%	37	7%	836	11%
Clerical Support Workers	93	22%	744	18%	496	21%	5	6%	106	21%	1444	19%
Service and Sales Workers	18	4%	124	3%	182	8%	1	1%	27	5%	352	5%
Skilled Craft and Related Trades Workers	19	4%	734	18%	453	19%	1	1%	82	17%	1289	17%
Plant and Machine Operators Assemblers	48	11%	638	16%	286	12%	63	71%	78	16%	1113	15%
Elementary Occupations	136	32%	665	16%	297	13%	4	4%	99	20%	1201	16%
Row percent	**430**	**6%**	**4079**	**55%**	**2327**	**31%**	**89**	**1%**	**494**	**7%**	**7419**	**100%**

[6] It should be noted that the table represents the percentages by row i.e. % of workers across the chamber for each occupational group. The last column – TOTAL represents % in the column to demonstrate total percentage of disabled workers by occupational group.

More males with disability are employed in the sector, however the proportion of females with disabilities is higher (35%) than that of able bodied female workers. Similar to their able bodied counterparts, these women tend to be employed in clerical positions (60%). The majority of males with disability are artisans (craft and related trades workers) as seen in Figure 19 below. There is an even split in terms of professionals and almost 40% female technicians.

Figure 19: Occupational Categories and Gender of Employees with Disabilities (merSETA WSP, 2018)



1.6 CONCLUSION

The weak economic performance experienced by the sector is negatively affecting employment especially among lower skilled workers. Industry has invested in automation to remain relevant in the market, this creates ever more opportunities for highly skilled workers, but these opportunities are not labour intensive and are becoming ever more capital/automation intensive. Many unskilled and semi-skilled workers will not be absorbed by the labour market unless their skills meet market requirements.

From a skills perspective this presents a dilemma in terms of supporting required high level technical skills to the detriment of the masses for whom there may not be employment opportunities. The SETA will therefore have to ramp up efforts to support the upskilling of its current 45% of workers at operator and elementary level.

The profile of the sector should be used to understand the status quo in terms of skills and ensure that the pipeline of skills be examined in light of challenges highlighted to put in place mechanisms for demand led skills interventions, while fostering lifelong learning and development of the current workforce.

The statistics on demographics, disability and education shows some improvement, but the transformation agenda still needs impetus. Promoting skills for local economic development will assist workers to access livelihoods in their own communities.

2 KEY SKILLS ISSUES

This chapter identifies factors that are driving change in the sector and influencing skills demand and supply either positively or negatively. The chapter will identify and analyse skills issues such as technological innovation, global and economic environment, and government policies and strategies that influence considerations of skills supply and demand in the mer sectors.

2.1 CHANGE DRIVERS

Table 10 below indicates the change drivers (among others) for each of the mer sectors identified through merSETA's 2018 supply and demand study as well as additional interviews with key stakeholders regarding key drivers.

Table 10: Industry Drivers (Source: merSETA Supply and Demand Study 2018)

DRIVERS	AUTO	METAL	MOTOR	NEW TYRE	PLASTICS	NO. OF CHAMBERS
Automation and Technology	x	x	x	x	x	5
Environmental Consideration	x	x	x	X	x	5
Challenges to Market Growth/Alternate Production locations	x	x	x	x	x	5
Innovation (Product Innovation)	x	x	x	x	x	5
Supply Chain Integration	x	x	x	x	x	5
Competition from lower-cost Chinese products		x	x	x	x	4
Basic Education and the Quality of Training	x	x			x	2
E-Commerce in Vehicle Sales	x					1
International Competition		x				1
Mobility of Shop Floor Workers			x		x	1

From the table above, it can be seen that automation and technology, environmental considerations, challenges to market growth and innovation are key factors that are impacting most chambers. These key issues can be located in broader drivers as highlighted in government's national strategy to alleviate poverty, unemployment and inequality through support for manufacturing, the green and blue economies and the importance of industry 4.0. As such, the following drivers have been highlighted as they present not only the challenges the sector face, but also solutions which merSETA can align to in order to relieve the pain points experienced by our sectors.

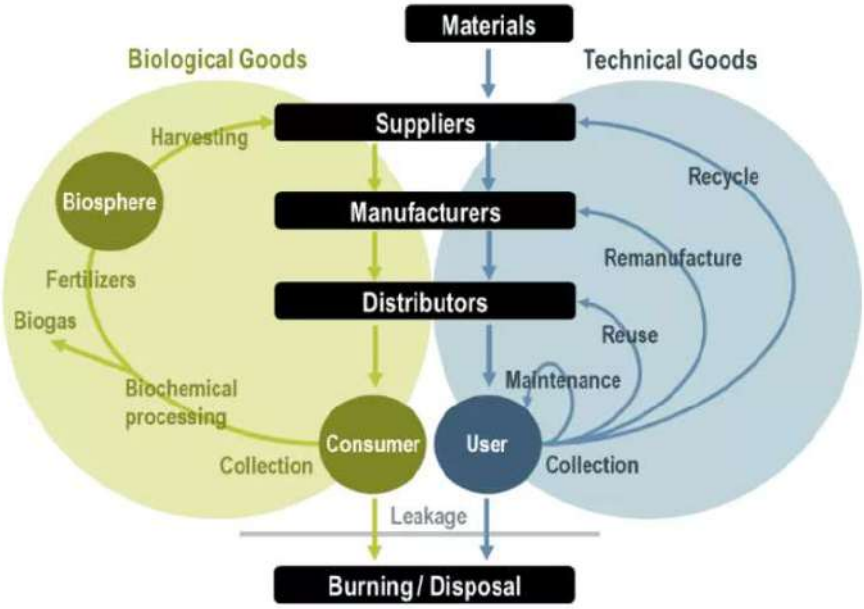
2.1.1 Circular Economy

The circular economy which has gained a lot of attention globally can be seen as an economic model that minimises resource input and waste generation. The circular economy has also gained attention in South African with platforms such as the World Economic Forum held in 2017 in Durban discussing strategies for developing a circular economy in the South African context.

The top three principles of the circular economy is to preserve and enhance natural capital by controlling finite stocks and balancing renewable resource flows; to optimise resource yields by circulating products, components and materials in use at the highest utility at all times in

both technical and biological cycles and lastly, to foster system effectiveness by designing out negative externalities (Ellen MacArthur Foundation, 2018).

Figure 20: Circular Economy (Transport Geography, 2018)



Waste does not exist when the biological and technical components of a product are designed with the intention to fit within a biological or technical materials cycle designed for remarketing, remanufacture, disassembly or repurposing (Ellen MacArthur Foundation, 2013). As illustrated in Figure 20, biological goods refer to non-toxic materials which can easily be returned to the soil and may yield higher-value substance before decomposing. Technical goods refer to man-made materials designed to be recovered, refreshed and upgraded minimising the energy input required and maximising the retention value (Ellen MacArthur Foundation, 2013). As the manufacturing sector is situated at the centre of the circular economy (Figure 20), it is vital for the sector to consider both biological and technical material waste cycles within its manufacturing processes.

The circular economy can be seen as an economy of which both the green and blue economy are interlinked as they talk directly to the core principles of the circular economy focussing on facilitating environmentally sustainable “green” practices (EU Chamber of Commerce and Industry in SA, 2017; Marks and Hidden, 2017).

The South African government supports the green economy through the national Cleaner Production Centre of South Africa and supporting policies and the blue economy through Operation Phakisa, implemented in 2014 which focuses on marine transport and manufacturing, offshore oil and gas exploration, aquaculture as well as marine protection services and ocean governance. The focus on marine transport manufacturing has the opportunity to deepen component manufacturing and rebuild domestic capabilities facilitating re-industrialisation and localisation (DTI, 2016). It has been predicted that 462,000 additional jobs could be created in South Africa by 2025 by “going green” while the blue/ocean economy could create around a million jobs by 2033 (World Economic Forum, 2017; Vision 2030, 2017).

The circular economy offers opportunities to South Africa to establish new industries through unlocking areas ("dead capital" sitting in its landfills) where small businesses can be supported. By moving waste away from landfills towards alternative waste treatment across the entire waste hierarchy will create job opportunities and may thereby help counter the country's unemployment rates by unlocking the "dead capital" sitting in its landfills. Creating jobs in moving waste away from landfills towards alternative waste treatment across the entire waste hierarchy may help counter the country's unemployment rates. This may be achieved through cleaner production, industrial efficiency, dismantling, refurbishment and re-use, as well as new methods of collection (recycling), sorting, reprocessing and manufacturing (EU Chamber of Commerce and Industry in SA, 2017; merSETA Supply and Demand Study, 2018). Skills required for recycling are low-level skills which do not require occupational interventions. However, merSETA through the cooperatives model and community colleges can ensure workers in the manufacturing sector can be upskilled through the increase of financial and entrepreneurial skills and working together to facilitate small business development in the sector.

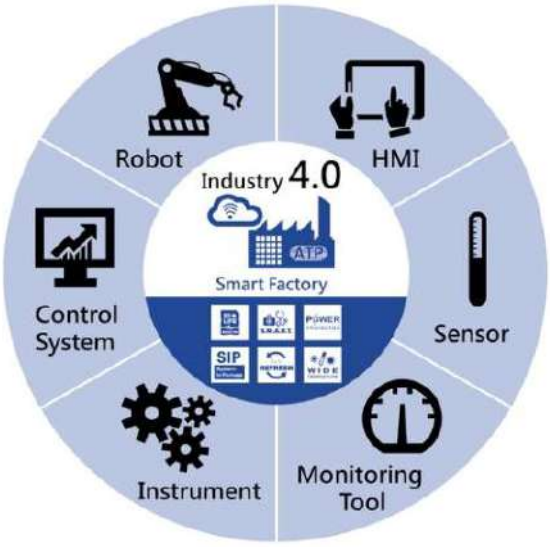
The South African manufacturing sector is increasingly integrating clean energy and green manufacturing techniques. With the change towards a more circular economy incorporating the green and blue economy, comes a shift in skills demand and training requirements as well. Therefore, the circular economy has been identified as a change driver. Currently, most skills in the manufacturing sector require up-skilling in terms of the circular economy (green and blue economy) which can be achieved through short to medium-term training, such as that from TVET colleges.

Such up-skilling interventions are supported by the merSETA through various programmes since the adoption of a cross-cutting theme of sustainability in 2012. To ensure the relevant skills are developed for the circular economy, curriculum design and development of new qualifications and occupations should take into account opportunities presented by this economy. Career awareness and training initiatives also need to respond to possible opportunities in the circular economy. Partnerships with local TVET colleges and universities should also focus on leveraging the opportunities presented by the circular economy to create a pool of skilled people locally and readily available to increase employment opportunities for local people especially the youth.

2.1.2 Industry 4.0: Impact on Manufacturing Processes and Skills

Globally, we are at the brink of a new era where technological developments such as advanced manufacturing are radically transforming the labour market across all industry sectors, especially the manufacturing sector. The manufacturing sector as a whole, traditionally has been a major source of employment, providing both high-skilled and low-skilled jobs. As technological advancements are continually transforming the labour market, it is seen as a major change driver. South Africa needs to develop the skills needed to successfully leverage the technological advances of tomorrow in conjunction with the tenets of inclusive economic growth, reduced poverty and unemployment as entrenched across national strategies and plans.

Figure 21: Advanced Manufacturing (Embedded-computing, 2018)



This shift towards advanced manufacturing will produce new interaction models among other things that go beyond simply automating production (Deloitte, 2017). South Africa's manufacturing industry is still at a foundational stage when it comes to the adoption of smart technologies that accelerate industry 4.0 (Figure 21) (Deloitte, 2017; merSETA Supply and Demand Study, 2018). Further technological advancements expected in the near future include advanced analytics or manufacturing analytics "MAnalytics", advanced robotics, increased adoption of 3D printing and 5G which is the fifth generation internet network relating to the concept of the internet of things (IoT) (Deloitte, 2017).

The increased adoption of robots and artificial intelligence in the South African manufacturing sector related to industry 4.0, has already affected jobs. Workers find that their skills are made redundant and they either face retrenchment or redeployment in areas where their skills can still be utilized. These realities faced by the current workforce must be taken into account to assist in job preservation and growth through realignment of skills where necessary. The expected future technological advancements in the sector will have devastating effect on an already stressed labour force if active steps are not taken to equip them with the necessary future skills such as IT skills and blended skills through (re-)training or upskilling these employees to understand and operate new and smart technologies (Deloitte, 2017).

With increasing technological advancements in the manufacturing sector, it is generally understood that higher level skills are preferred while the proportion of unskilled and semi-skilled workers in the sector are continuously declining (merSETA Supply and Demand Study, 2018). This is partly driven by the increase in cost of labour resulting in the automation of manufacturing processes. As employees now engage with complex technologies on an ongoing basis within the workplace, baseline qualifications required across the board are also increasing. This is supported by the majority of OEMs now only accepting individuals who have passed Grade 12 Mathematics as operators on the shop the floor. With the change of mostly a highly skilled labour force required in advanced manufacturing, merSETA has supported the establishment of research partnerships for manufacturing skills development through various interventions such as policy dialogue and partnering with Universities of Technology.

The advent of the 4th industrial revolution must not be viewed as a threat but an opportunity. Contrary to beliefs that technology will eventually replace the human worker, it brings with it many gains such as the adoption of new ways of production, creation of new jobs that were

non-existent and expansion of markets. Technology enhances worker productivity and firms use new technologies to improve capital utilization, overcome information barriers, innovate and allow for more efficient management of firm operations (World Banks, 2018). Failure to respond to these changes and opportunities by putting in placing appropriate mechanisms such as industrial development policies and strategies and skills development strategies is what constitutes a threat.

2.1.3 Future Educational Provision

Skills requirements for the circular economy, blue economy, green economy, automated workplaces and advanced manufacturing call for innovation not only with respect to adapting of workers and their skills, but also of the mode of delivery for up skilling, reskilling and offering on the job training. With changes happening quite rapidly, research conducted by the Department of Science and Technology indicates that while there is a demand for higher level skills, the new era with respect to advanced manufacturing in particular, lends itself to a mix of mid-level skills as an overall higher level of skill. As such delivery of education and training should also offer a mix of methods accessible to new labour market entrants as well as the current labour force.

The South African Government has already indicated the willingness to expand learning modality especially to those who experience barriers to participation such as geographic location, lack of access to digital infrastructure, time pressures, lack of admission qualifications, lack of finances etc. The department has therefore adopted an "open learning" strategy (Government Gazette, April 2017). It adheres to the tenets laid out in the White Paper which calls for an expansion of the system and adoption of the notion of lifelong learning. Critical components however are the maintenance of rigorous quality assurance over the design of learning materials and support systems.

Future ready curricula must be developed in time to meet the demands of the future. With this in mind there is an emphasis on science, engineering and technology, increasing digital fluency and using technology to solve complex problems.

- **These new or improved curricula must account for broad areas with respect to:** predictive analytics, artificial intelligence, additive printing, the internet of things (5G), nanotechnology, automation and robotics.
- **Professions in the future will typically center on the following types of jobs:** motor manufacturing technicians, wind turbine service technicians, flexible app developers, computer programmers, artificial intelligence and robotics specialists, and cloud computing specialists among others.

Across the African continent, substantial potential exists for creating high-value-adding, formal-sector jobs in a number of areas, but in order to realise this potential, closer dialogue between education providers and industry is needed to align and optimise the region's demand and supply of skills. Meeting the demand for future skills will require intense collaboration, cutting red tape and expediting approval and quality assurance across the system to ensure learners are able to take up positions with adequate skills and skills sets.

2.1.4 Re-industrialization and Localization

With the manufacturing sector's contribution to GDP having fallen from around 20% in 1994 to 14% in 2017, South Africa is de-industrialising (Viviers, 2016). In order to reverse the

country's de-industrialisation trend, will require advocation for and implementation of localisation (implies local procurement by government and the private sector). This needs to be adopted in a way in which the country's "globalisation" continues to be harnessed for competitiveness, while local content and related skills development through industrialisation are driven and adequately supported to grow (SA Cities Network, 2014).

During the 2017 state of the nation address, President Cyril Ramaphosa emphasised that industrialisation is one of the key approaches to revive the South African economy. The manufacturing sector is central in these processes as it has the ability to pull along growth through backward and forward linkages to the rest of the economy (Viviers, 2016). Re-industrialisation led by manufacturing could increase export prospects through localisation, enable the creation of employment opportunities, reduce inequalities and eliminate poverty in order for the country's economy to develop further. This is supported by government as the revitalisation of the manufacturing sector is one of the foundations of the government's various economic policy and strategy documents, of which two of the most influential are the National Development Plan (NDP) and the Industrial Policy Action Plan (IPAP).

Rob Davies, the Minister of Trade and Industry emphasised that localisation is an important policy tool for industrial development in South Africa and will produce value-added and competitive outputs and facilitate easier access into global and regional value chains, assist in growing the manufacturing sector and the economy (Viviers, 2016; Engineering news, 2018). Developing innovative applications in locally beneficiated products could provide access to new markets that would contribute towards expanding and diversifying the country's industrial base. The challenge for South Africa's export sector is to enhance its global competitiveness and value addition, to diversify its product offer and penetrate non-traditional markets, especially in rapidly growing emerging and developing economies (FTI Consulting, 2018). Government is prioritising support for domestic procurement and localisation through the Preferential Procurement Policy Framework Act. This Act stipulates that it is government's preference that State entities buy locally manufactured goods and has allowed for government to designate certain products that have to be bought from locally manufactured sources, according to meticulous specifications. All organs of State must purchase products indicated according to the specifications of designations (Engineering news, 2018). Government through the multi-trillion Rand national infrastructure plan under the direction of the Presidential Infrastructure Coordinating Commission (PICC) also seeks to address and reverse the de-industrialisation trend of the past two decades (SA Cities Network, 2014).

Although re-industrialisation and localisation holds great potential if successfully achieved, currently South Africa is faced with high unemployment rates and an enormous skills shortage which will obstruct the reindustrialisation drive before it starts (Businessday, 2018). More than 6 million South Africans are unemployed, and youth unemployment remains stubbornly above 50% (Businessday, 2018). Kaizer Nyatsumba, SEIFSA's CEO emphasised that re-industrialisation will require technical skills such as those offered by artisans, but that South Africa does not produce a sufficient number of artisan skills on a yearly basis compared with universities, universities of technology and colleges (Engineering news, 2018). This is mostly due to TVET colleges being regarded as inferior, but as re-industrialisation becomes reality the demand for artisans produced will increase in demand. Therefore, TVET colleges need to be revamped to meet the quality/ quantity needs with regards to the supply of artisans/ technicians.

2.2 ALIGNMENT WITH NATIONAL STRATEGIES

Several national policies give direction to the manufacturing, engineering and related industries, including: the New Growth Path, the National Development Plan, and the National Industrial Policy Framework and the associated Industrial Policy Action Plan.

Collectively, their aim is to encourage employment-intensive growth (Bhorat, H., & Rooney, 2017; Williams, Cunningham, & De Beer, 2014). They all have at their core; key levers to ensure continued economic growth, job creation, sustained livelihoods, social justice and access to decent living conditions through human and community development. These plans draw a focus to the following key issues that the merSETA needs to respond to through various interventions:

- Transformation of the national economy
- Inclusive growth
- Community Development
- Making opportunities available to People with Disabilities (PWD)
- Supporting the Green and Blue Economies
- Supporting the informal, small and medium business
- Rural development
- Youth Development

The merSETA acknowledges the significance of national strategies in driving imperatives that are central for the growth and development of South Africa's civil and business sectors. The National Development Plan, National Skills Development Plan, Human Resource Strategy and Rural Development Strategy and the IPAP aims to stimulate sustained economic growth through re-industrialisation and "learning by doing" in order to compensate for global shifts and uncertainty in an age of technology. It acknowledge the manufacturing sector as the main sector to drive economic growth and employment creation.

IPAP's assessment is that: "Skills development and training has emerged as one of the key constraints holding back a number of, if not all, sector development" (2007, p41). It notes "a need for greater and stronger integration between industrial and skills policy and implementation, particularly with respect to sector strategies" (2007, p41).

The latest iteration of IPAP 2018/19-2020/21 highlights some of the achievements from the automotive sector, plastics sector and metal fabrication, capital and rail transport equipment which are the key features of the merSETA industries.

The IPAP unpacks three sectoral focus areas in relation to the mer sectors (manufacturing, engineering and related services sectors) that have skills development dimensions which should be leveraged by the merSETA and its stakeholders to guarantee sectoral development through skills.

Automotive sector: The sector continues to play a central role to the South African economy. During 2016, total contribution of the automotive sector to GDP was 4.0%, 33% to the manufacturing sector and 82 000 in employment (IPAP, 2018). Nevertheless, some of the pressing challenges facing the sector is relatively small domestic market and the overall competitiveness gab between South Africa and other competing regions. To address these constraints, the South African government is putting in significant effort to support local industries and integration to the international market through various programmes and initiates. In 2017 the state formed the Automotive Master Plan which is set to be adopted in

the second quarter of year 2018/19. The Automotive Master Plan seek to further develop the automotive industry to 2035 by supporting six central priorities which include local market optimisation, regional market development, localisation, infrastructure development, industry transformation, and technology and associated skills development. Furthermore, the Automotive Supply Chain Competitiveness Initiative (ASSCI) will continue to be implemented in the key areas to improve supplier competitiveness. Key to this is supporting skills programmes related to engineering and the trades for industry supply and ensuring sustainable productivity.

Metal fabrication, capital and rail transport equipment: The metal fabrication, capital and rail transport equipment consist of manufacturing sectors of ferrous metals, non-ferrous metals, capital equipment (largely used in manufacturing and development of infrastructure) and rail transport equipment. Despite government efforts to prioritise localisation within these sectors, the sectors are still confronted by challenges that threaten the industry's competitive advantage to the international market. This is underscored by the recent decision by the U.S. government not to exempt South African steel products from import duties which will cost local exporters an estimated R3 billion (SEIFSA, 2018). Above all, some of the impediments faced by these sectors are as a result of inadequate policy alignment and poor coordination of essential value chains causing negative implications and this incorporates uncompetitive inputs costs, inefficiencies across the value chain and unequal trading platforms.

The Industrial Policy Actin Plan also states that a lack of skills enhances these problems, particularly with respect to qualified artisans, technicians, engineers and project managers. The SIPs present the largest single opportunity to stimulate industry on the back of localisation requirements and focused supplier development programmes. Significant investments in rail network and infrastructure projects on the African continent will increase the demand for locomotives and wagons. In addition, the African Union's pronouncement of South Africa as a rail Centre of Excellence for the African continent provides a vital platform to deepen South Africa's rail manufacturing capabilities. Opportunities exist to integrate the rail rolling stock suppliers into the global value chain of the OEMs.

Plastics industry: Plastics and plastic components have become a fundamental pillar in the South African economy, producing goods, applications and services used across the entire economy, including infrastructure programmes, construction, general engineering, mining, automotive, packaging and boatbuilding materials. The IPAP 2018/19 stipulates that in 2016, the plastics sector contributed about R76 billion to the total economy, representing about 1.9% of GDP and approximately 16.5% of manufacturing sector output. The plastics industry employs around 60,000 people (both formal and informal), with almost 1,800 companies across the plastics supply chain (IPAP, 2018). This gives indication to the merSETA as the driver of skills development that there should be an increased focus to support training initiatives in this sector.

Like other sectors, the plastics sector is also confronted by constraints with respect to access to key raw materials; pricing of raw materials, relatively small local and regional market; lack of advanced manufacturing practices; lack of downstream focus of Research and Development efforts; and South Africa's geographic position and resultant logistics costs. Government has prioritised support for the sector through optimised localisation and public procurement to foster economies of scale. Some of the key interventions highlighted in the plan is the development of polymers from waste which will address the increasing local demand of polyethylene polymers. The second intervention is plastics industry skills

development, testing and innovation, which will focus on improving innovation and competitiveness in the plastics industry through skills development and R&D and testing. The third intervention is the increased integration of plastics components into the automotive sector to promote the localisation of plastics components and increase the local plastics manufacturing base.

The merSETA has shown a strong drive to support skills development initiatives by conducting a national study on Labour and Skills Supply and Demand which aims to understand skills composition in the SMME, formal and informal enterprises that incorporates activities in the plastics industries. Further areas of intervention for merSETA should be on the improvement of critical skills for sustainable growth and assisting unemployed learners to participate in accredited work, integrated learning and workplace experience programmes to promote employability and sustainable livelihoods.

2.3 CONCLUSION

It is clear from the discussion in this chapter that the manufacturing, engineering and related services sector is experiencing significant changes due to domestic and global economic developments. The circular economy is projected to create new economic and employment opportunities. This places emphasis on the need to support the green economy and blue economy as strategies for creating new opportunities for growing the manufacturing sector. In an effort to build a global competitive manufacturing sector, re-industrialisation and localisation are key initiatives driven by IPAP aimed at promoting growth of the sector and its capability to create more jobs. Technology is also a significant change driver in the sector, but has a far reaching impact on skills development and labour demand. It is also evident that merSETA needs to play an increasingly active role in supporting government imperatives. Many of these can be achieved through supporting skills development initiatives for key national strategies of which the IPAP captures many critical policy levers to affect real change.

A critical component however is anticipating skills needs of the future and putting in place mechanisms able to meet those needs through innovations in skills provision in the post schooling sector. If one considers that in the preceding chapters, the economy is waning, making workplace based learning difficult due to sheer lack of workplaces and therefore making post school training more difficult unless government support wider access and new forms of delivery as expressed in the recent open learning policy framework. merSETA is already exploring options to widen access to training through leveraging skills development opportunities in more small, medium and possibly even informal workplaces. This requires innovation in skills provision without hindering quality. Policy also needs to respond to these changes to create an enabling environment for innovation in skills provision to flourish.

3 OCCUPATIONAL SHORTAGES AND SKILLS GAPS

This aim of this chapter is to highlight skills supply and demand issues as well as to identify the occupational shortages and skills gaps in the sector. The data was sourced from multiple datasets and documents such as the merSETA WSP data, merSETA research, desktop research and Statistics South Africa as well as interviews with merSETA stakeholders.

3.1 SKILLS SHORTAGES

3.1.1 Analysis of Hard to Fill vacancies in the Sector

The WSP 2018 data provides information on hard to fill vacancies (HTFVs) based on a template provided by the DHET from the proposed Workplace Skills Survey (WSS) as well as high level interviews with sub-sector representatives including employers and labour, for these interviews, the proposed DHET interview guide was utilised.

Of all the WSPs submitted, 4140 companies filled out the skills requirements section pertaining to HTFV[7]s. Of these, 3619 companies indicated that they did not have any HTFVs. The reasons stated was as follows:

- 38% indicated that they had no vacancies.
- 62% indicated that they were able to easily fill the vacancies that they had.

Of those companies (filling out the WSP) and interview respondents that did indicate their HTFVs, the data yielded 521 companies, highlighting 463 hard to fill occupations which required a total of 5692 candidates. Further to the DHET HTFV question, the merSETA requested that companies indicate the total number of HTFV and the number of HTFVs that remain unfilled.

The table below, demonstrates total vacancies by occupational category. These vacancies are deemed to be difficult to fill with a significant proportion remaining unfilled. The table below shows that companies struggled to fill positions for technicians, managers and sales workers respectively, with least difficulty in filling positions for plant and machine operators.

Table 11: Total Vacancies in the Sector by Occupational Category (merSETA WSP, 2018)

OCCUPATIONAL GROUP	NO. OF COMPANIES	TOTAL HTFV	UNFILLED HTFVS	% VACANCIES UNFILLED
Managers	165	580	299	52%
Professionals	231	559	195	35%
Technicians and Associate Professionals	128	298	164	55%
Clerical Support Workers	76	220	69	31%
Service and Sales Workers	67	1874	723	39%
Skilled Agricultural, Forestry, Fishery, Craft and Related Trades Workers	352	1586	567	36%
Plant and Machine Operators and Assemblers	41	406	51	13%
Elementary Occupations	29	168	58	35%
Total	**1089**	**5691**	**2126**	**37%**

[7] It should however be noted that mer stakeholders have raised concern with respect to HTVFs being a focus for skills demand as these are based on current demand and does not indicate future demand nor the overall trajectory of the sectors given current economic circumstances. To this end it was suggested that forecasting is needed to better address demands in the short, medium and long term.

3.1.2 Reasons for Hard to Fill Vacancies

In the analysis, occupations that are deemed difficult to fill refer to occupations in which respondents reported that there were 15 or more vacant positions. As demonstrated by the tables below, sectors reported greatest difficulty in recruiting talent into service and sales work, craft and trades work and management respectively.

Reasons for the hard to fill vacancies for managers was mostly due to lack of experience and lack of equity candidates to take up the occupations. The only other group in which there was difficulty with respect to finding equity candidates was the operator occupations, this group also lacked qualifications. The majority of groups lacked experience combined with, specific skills an all too common phenomenon in the mer sectors as explained by many interviewees, having a qualification is not enough, candidates also need to have relevant experience and a specific skill set to go along with the qualification – particularly technical skills. The biggest difficulty is in finding candidates with the right experience, the right qualifications and the right skill set as highlighted in red in Table 12 below. Employers did not consider personal attributes of candidates, poor remuneration nor geographical location as major setbacks with regard to filling vacancies as highlighted in green.

Table 12: Reasons for Hard to Fill Vacancies by Occupational Category (merSETA WSP, 2018)

REASONS	MANAGERS	PROFESSIONALS	TECHNICIANS AND ASSOCIATE PROFESSIONALS	CLERICAL SUPPORT WORKERS	SERVICE AND SALES WORKERS	SKILLED CRAFT AND RELATED TRADES WORKERS	PLANT AND MACHINE OPERATORS AND ASSEMBLERS	ELEMENTARY OCCUPATIONS	TOTAL
Candidates do not have the right experience	316	199	65	105	1072	243	30	86	2116
	54%	**36%**	**22%**	**48%**	**57%**	**15%**	**7%**	**51%**	**37%**
Candidates do not have the right personal characteristics/attitudes	5	4	16	6	4	31	0	0	66
	1%	**1%**	**5%**	**3%**	**0%**	**2%**	**0%**	**0%**	**1%**
Candidates lack specific qualifications	16	51	85	11	50	653	161	12	1039
	3%	**9%**	**29%**	**5%**	**3%**	**41%**	**40%**	**7%**	**18%**
Candidates lack specific skills	97	111	98	92	740	553	93	70	1854
	17%	**20%**	**33%**	**42%**	**39%**	**35%**	**23%**	**42%**	**33%**
Equity considerations makes it difficult to find candidates	130	169	21	4	7	43	117	0	491
	22%	**30%**	**7%**	**2%**	**0%**	**3%**	**29%**	**0%**	**9%**
Poor remuneration	13	24	10	2		34	5	0	88
	2%	**4%**	**3%**	**1%**	**0%**	**2%**	**1%**	**0%**	**2%**
Vacancy situated in remote/difficult to access location	3	1	3	0	1	29	0	0	37
	1%	**0%**	**1%**	**0%**	**0%**	**2%**	**0%**	**0%**	**1%**
Grand Total	580	559	298	220	1874	1586	406	168	5691
	100%	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Table 13 below shows the hard to fill vacancies by occupational group for companies that indicated they require these vacancies. The vacancies are only those that had 15 or more unfilled seats. This means that employers were not able to fully fill their recruitment requirements at the time of data collection.

Table 13: Hard to Fill Vacancies by Occupation (merSETA WSP, 2018)

Occupational Group	Occupation	Total HTFV
MANAGERS	Corporate General Manager	177
	Office Manager	45
	Sales Manager	138
Total		**360**
PROFESSIONALS	Electrical Engineer	21
	Mechanical Engineer	32
Total		**53**
TECHNICIANS AND ASSOCIATE PROFESSIONALS	Credit or Loans Officer	59
Total		**59**
CLERICAL SUPPORT WORKERS	Cost Clerk	51
	Office Machine Operator	20
	Outbound Contact Centre Consultant	30
Total		**101**
SERVICE AND SALES WORKERS	Automotive Parts Salesperson	122
	Motorised Vehicle or Caravan Salesperson	1676
Total		**1798**
SKILLED AGRICULTURAL, FORESTRY, FISHERY, CRAFT AND RELATED TRADES WORKERS	Automotive Motor Mechanic	297
	Boiler Maker	40
	Diesel Mechanic	54
	Fitter and Turner	20
	Forklift Mechanic	73
	Lift Mechanic	15
	Metal Machinist	20
	Pipe Fitter	60
	Welder	80
Total		**659**
PLANT AND MACHINE OPERATORS AND ASSEMBLERS	Metal Processing Plant Operator	117
	Product Assembler	75
	Reinforced Plastic and Composite Production Worker	105
Total		**297**
ELEMENTARY OCCUPATIONS	Metal Engineering Process Worker	41
	Plastics, Composites and Rubber Factory Worker	23
Total		**64**
Grand total		**3391**

There has been a decrease in demand for people at the lower occupational levels despite the fact that the lower skills categories such as elementary workers still constitute 19% of employees in the sector (merSETA WSP, 2018). The data seems to suggest that there are ever fewer jobs available within the low skilled and unskilled levels despite the fact that this is where the majority of workers are situated. There is most variety with respect to the types of skilled trades.

There appears to be a high demand for sales workers and managers are earlier indicated however technicians appear to have reduced demand in terms of volume, with only the credit and loans officer occupation being HTFV for occupations with more than 15 vacancies unfilled.

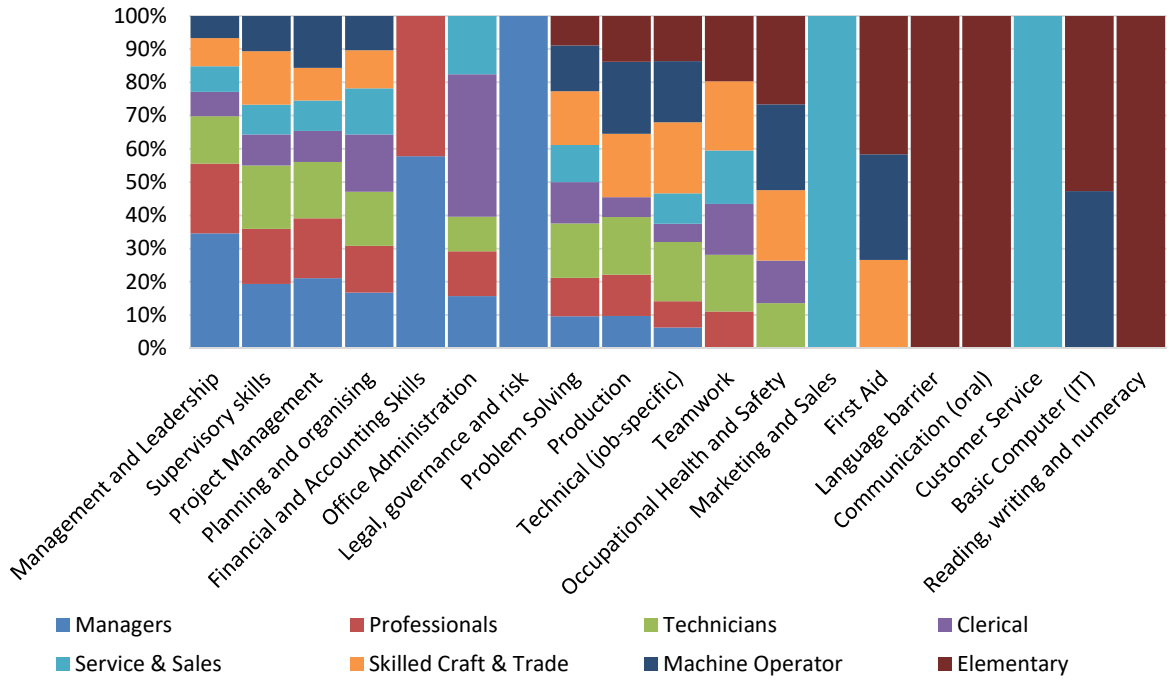
3.2 SKILLS GAPS IN THE SECTOR

According to the DHET SSP framework, skills gaps refer to "skills deficiencies in employees or lack of specific competencies by employees to undertake job tasks successfully to required industry standards. Skills gaps may arise due to lack of training, new job tasks, technological changes, or new production processes, to list a few. The term 'top up skills' also refers to skills gaps and usually requires a short training intervention".

Throughout this document the notion of future skills has been noted in light of globalisation and competitiveness, re-industrialisation and advanced manufacturing. Along with these trends arise critical skills and skill sets which are required by workers that are not necessarily found in traditional institutional learning (merSETA Supply and Demand Study, 2018). The world of work is changing as so is the notion of a workplace. In order for workers to keep pace and remain viable over time, they need to possess key skills that will allow them to be more successful in their work and more marketable to relevant sectors.

Analysis of skills gaps information yielded the following:

Figure 22: Skills gaps by occupational group (merSETA WSP, 2018)

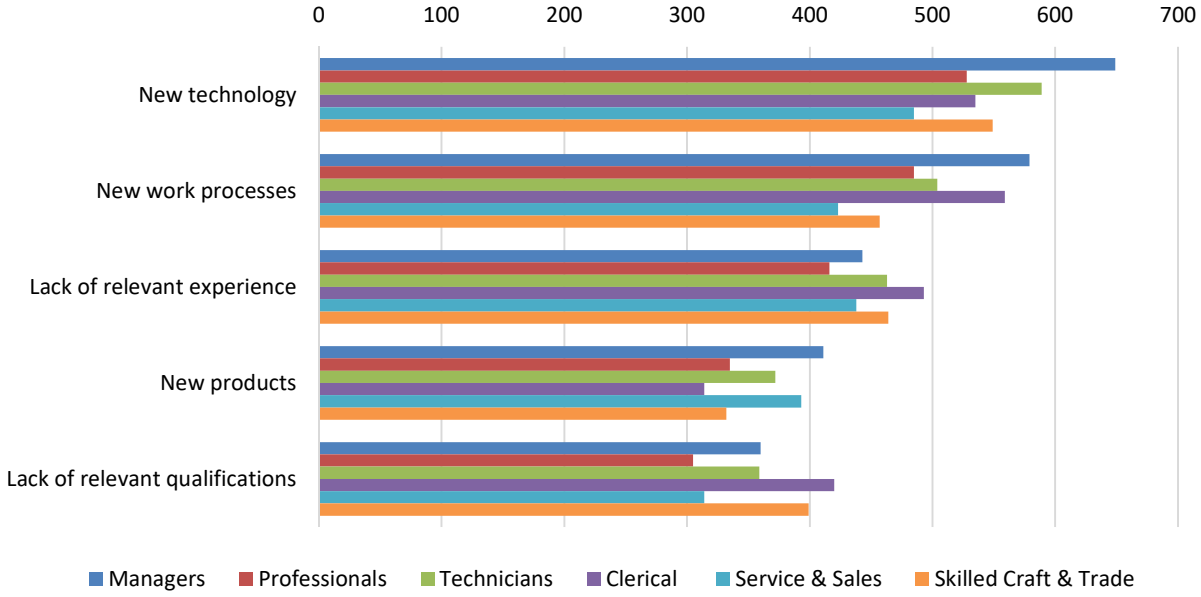


It has been noted previously noted that with automation on the shop floor, workers need to be re-skilled and up-skilled to take on opportunities. In order to do this, workers must possess key behaviours and mindsets in order to navigate a successful, progressive career. It may even be said that from the time workers start their training, they should already have a good grounding on which to develop critical skills for success. An example of this is when apprentices attended a focus group discussion for an innovation initiative being developed by the merSETA to implement an ICT enabled platform to track learning and WIL. The developers and researchers noted that young apprentices felt hopeless with respect to their situation because they are well aware of the difficulties in accessing employment opportunities. However, they also note that they entered the apprenticeship due to a lack of any other opportunity given and a limited ability to finance occupational training themselves. This may indicate that the workers of the future have not identified with their "chosen" trade, they feel hopeless and moreover there seems to be a hesitance to engage in technologies beyond

mobile messaging and social media.[8] Further research is required to better understand the skills gaps that exist in the predominant mer sector occupations. As such, this section is dominated by desk research, although the COMET study as well as Chamber research reports reveal key findings in this regard.

The reasons for skills gaps are outlined in Figure 23 below. It would appear that overall the notion of a changing workplace is the main driver of skills gaps, thus technology and new processes are high on the list for most occupational categories followed by a lack of experience and relevant qualifications.

Figure 23: Reasons for Skills gaps by occupational group (merSETA WSP, 2018)



Based on further discussions and desk research the following gaps are highlighted:

Critical thinking and problem solving seems to be challenging in the current training space as demonstrated by the COMET study. Learners demonstrated low holistic problem solving competence, skills demonstrated reflect the challenges of limited lecturer competence and the emphasis on theory (Jacobs, 2017). These traits are important in most, if not all occupations of the future, according to Tony Wagner (2017). The workforce today is organized very differently than it was a few years ago. What we are seeing is diverse teams working on specific problems, as opposed to specific specialties. Managers do not have all the answers and solutions—teams have to work to find them.

Collaboration and leadership as already discussed, is the key to solving problems and requires a particular mind set as well as the ability to work with others in teams. In order to get teams to work effectively, leadership skills are required that embrace positive influence rather than exerting authority. When one considers those apprentices who felt insecure about their future, perhaps being afforded opportunities to achieve goals through collaboration and effective leadership would strengthen their resolve. This could be likened to Blooms Taxonomy as presented by Prof Bawa (NSA, 2017), the domains of learning comprise mental skills or knowledge, manual skills or doing and affective components related to emotions and

[8] These sentiments are based on a preliminary focus group with apprentices for one of merSETA's innovation projects, the final research report will be made available upon completion of the project.

attitudes. Our initial interviews with stakeholders highlighted the need for emotional intelligence, this was highlighted by both labour organisations as well as employers. These three domains can enable the worker or learner to use theory to do a particular task, assess the outcomes and feedback and master the skill/s over time. These dimensions can positively influence the workplace and foster innovation. Communication is a key skill in this respect and as many sectors move to more knowledge based activities, the ability to communicate effectively is key.

Resilience, agility and adaptability is highly important in modern workplaces. As companies need to adapt to changing consumer needs, so too workers should be able to adapt and learn new skills. Lifelong learning is a concept that all workers must take on to remain viable across all levels (this was confirmed by most interview respondents). Some skills are becoming redundant with changing technologies and the pace at which technology develops is faster than ever. Workers in the mer sector must adopt skill sets that allow them to take on these challenges either through taking on a parallel function or deeper specialisation in their current function. There is a need to reconsider the focus of education and training in light of these skills gaps; the mode of delivery is important and making training relevant to the real world scenario is key. Many of these skills are related to lifelong learning and can be instilled in learners prior to them entering the post schooling phase. Taking into consideration the key driver of adopting a training framework for the needs of the current and future workforce as highlighted in chapter 2, the system must also ensure that trainers and lecturers are themselves able to embody these critical skills.

3.3 EXTENT AND NATURE OF SUPPLY

3.3.1 Current Supply

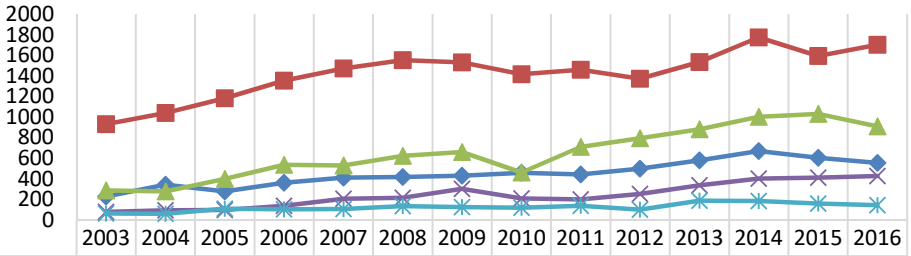
The stock of skills available to the metals, automotive and plastics manufacturing sectors includes the group of people currently employed (as described in the sector profile). Current unemployed people who were previously employed in the sector, must also be considered as part of the current supply of skills. The sector has shed jobs year on year since 2008.

3.3.2 Higher Education and Training

While a range of general qualifications from the Higher Education and Training (HET) sector in the areas of finance, accounting, human resources and Information and Computer Technology (ICT) are utilised in the merSETA sector, the output of engineers is most relevant. Particularly in the fields of electrical engineering, mechanical engineering, chemical engineering, industrial engineering, and metallurgical engineering.

Figure 24 below, shows the total number of graduates with national diplomas in selected engineering fields from 2003 to 2016. These graduates become available to the national economy as engineering technicians in the relevant engineering disciplines. Electrical engineering continues to have the highest output (1702 in 2016), followed by mechanical engineering (908 in 2016) and chemical engineering (555 in 2016) (HEMIS, 2018). Output from all fields has increased substantially over the fourteen-year period, although a slight decrease in output was reported in all fields except for electrical and industrial engineering when compared to the output of 2015 (HEMIS, 2018).

Figure 24: Number of National Diplomas Awarded in Selected Engineering Fields: 2003-2016 (Source: CHE, HEMIS, 2018) ** Latest available data



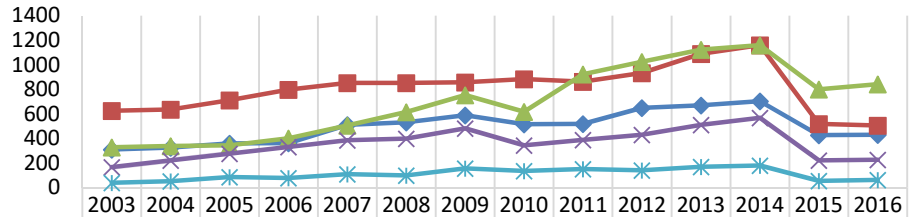
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
CHEMICAL ENGINEERING	230	342	279	362	411	418	431	460	444	499	580	671	604	555
ELECTRICAL ENGINEERING	930	1039	1184	1354	1472	1552	1532	1417	1460	1372	1536	1775	1594	1702
MECHANICAL ENGINEERING	288	279	398	537	530	623	660	463	711	793	883	1004	1032	908
INDUSTRIAL ENGINEERING	80	94	97	139	207	216	302	210	199	253	336	404	413	427
METALLURGICAL ENGINEERING	63	60	111	105	107	136	127	120	138	100	189	185	160	144

Figure 25 below, shows the number of first degrees awarded in the same selected engineering fields during the ten year period of 2003-2016. Upon successful completion of their qualifications and a minimum three years practical experience, these graduates become available to the national economy as engineers or engineering technologists and can register with ECSA as professional engineers or engineering technologists in their respective fields.

In 2010, a decrease in total output was reported across all fields except electrical engineering which showed a 3% increase during the same year. In the following year (2011) increase in output was the greatest in mechanical engineering (923) followed by electrical engineering (863), and chemical engineering (519) (HEMIS, 2018).

Compared to 2015, the output of all engineering fields except for electrical engineering increased slightly in 2016 (Figure 25). Despite the limited increase, the effects of the "fees must fall" campaign in October 2015 are still evident as the output rates have not recovered to pre-fees-must-fall rates in 2014 (HEMIS, 2018).

Figure 25: First Degrees Awarded in Selected Engineering Fields: 2003-2016 (Source, CHE, HEMIS, 2018) ** Latest available data



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
CHEMICAL ENGINEERING	309	327	361	363	511	533	588	515	519	649	670	703	428	430
ELECTRICAL ENGINEERING	627	637	712	799	852	853	858	884	863	934	1091	1160	519	505
MECHANICAL ENGINEERING	328	338	345	401	506	615	754	619	923	1024	1123	1159	801	843
INDUSTRIAL ENGINEERING	167	221	275	332	387	400	482	344	388	430	510	568	221	226
METALLURGICAL ENGINEERING	38	51	86	79	109	99	157	135	151	140	170	179	54	62

Importantly, graduates with national diplomas and first degrees from the HET system have to meet the needs of all sectors of the national economy that require these skills, and not only the needs of the manufacturing, engineering and related services sectors. Competition between sectors is strong because, despite the positive growth in output in all fields, these increases have not been sufficient to alleviate the shortages of these skills in the country. As

such, direct support for the generation of these skills through incentive schemes such as bursaries plays a critical role in channeling graduates into the manufacturing, engineering and related services sector.

A study conducted by the Human Sciences Research Council (HSRC) found that the engineering skills development pipeline is not only long, but is also being adversely affected by a number of factors. One of these factors is the poor-quality schooling system in South Africa, with low enrolment in the critical subject areas of maths and physical science (combined with low-quality teaching and low pass rates in these subjects), which poses a fundamental challenge to growing the national pool of engineers. Engineering faculties also compete with other faculties for enrolments from a small pool of eligible school leavers, among whom Africans are still under-represented (HSRC, 2013).

Poor school preparation is a factor of poor engineering throughput rates, together with other issues such as the increased engineering class sizes; the difficulty some students have in accessing study finance; and limited workplace-training opportunities, which are compulsory for graduation for students from the universities of technology (Du Toit and Roodt, 2009). Another key factor, is the difficulty candidate engineers (having successfully passed their academic studies) have in obtaining mentorship support that would allow them entry into and registration with ECSA. This challenge, arising out of historical racial and gender imbalances is a serious threat to retaining these high potential candidates for the sector.

3.3.3 Learnerships and Apprenticeships

Since its inception, the merSETA has registered 83 382 apprentices on apprenticeships and 89 461 learners on learnerships. The predominant trades attained through apprenticeships include motor mechanic, diesel fuel injection mechanic, electrician (engineering), fitter and millwright. In the same period, a total of 49 743 apprentices qualified as artisans in the sector and another 48 823 learners successfully completed their learnerships (QMR, 2018). The most dominant learnership programmes completed include welding application, automotive components: manufacturing and assembly, production technology, automotive repair and maintenance and metals production (QMR, 2018).

The annual registration and completion figures for apprentices and learnerships since 2002 are shown in Figure 26 and Figure 27 below. It is clear that apprenticeships and learnerships form a crucial part of the supply of skills to the sector. Therefore, the merSETA continues to support the uptake of these learning pathways and continues to monitor trends in registrations and completions.

Figure 26: Apprenticeships Entered and Certified (merSETA QMR, 2018)

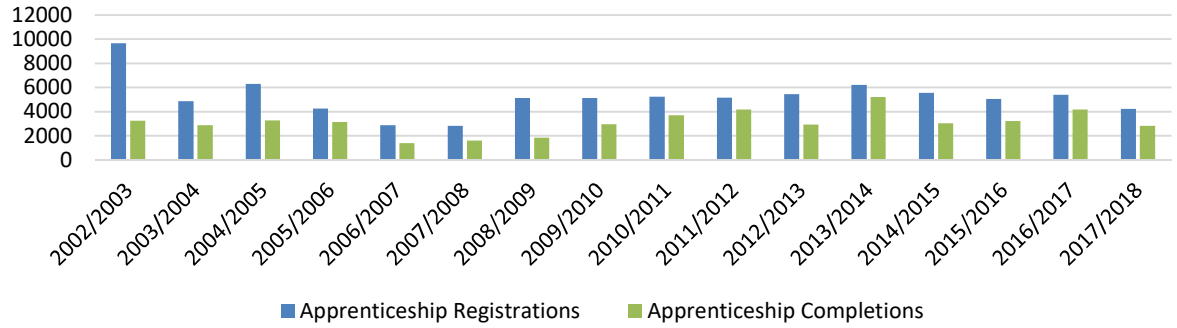
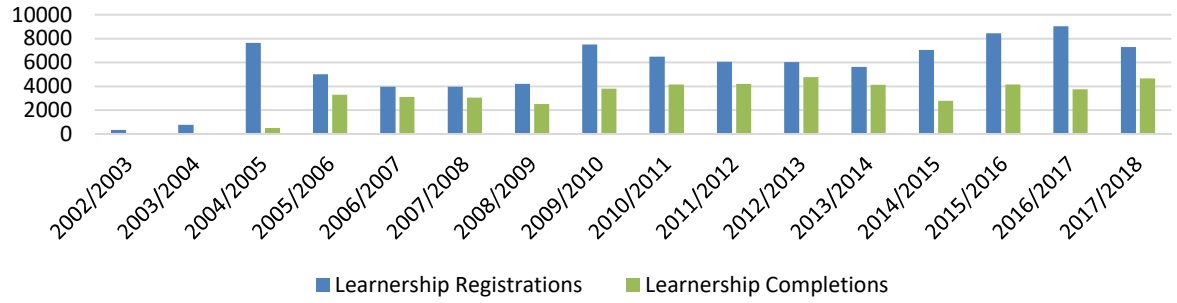


Figure 27: Learnerships Entered and Certified (merSETA QMR, 2018)



3.3.4 TVET Colleges

Traditionally, TVET college programmes in engineering have been very limited and narrow in content as they were designed to meet the demands of manual low-skill and low-wage industries. This has resulted in challenges for universities and universities of technology in their attempts to recognise these qualifications for articulation purposes. According the merSETA QMR data, the main trade areas studies towards in TVET Colleges in the manufacturing sector include among others Electrical engineering, boilermaker, diesel mechanic, and engineering and related design (QMR, 2018). Additionally, as the work-experience component of training is not enforceable, employers have been reluctant to accept these students.

TVET colleges form a critical component of the current training capacity of artisans. TVET colleges offer training for the NQF Level 4 National Certificate (Vocational) (NCV) and merSETA currently has relationships with the majority of TVET colleges. Through partnerships with public TVET colleges, the merSETA is increasing the artisan development pipeline through the NCV artisan training programme. This programme has offered NCV learners an alternative pathway to becoming artisans, besides following the traditional apprenticeship pathway.

Government has highlighted the long-term importance of TVET colleges in generating the skills that will assist the nation in reducing poverty and unemployment, and their short-term importance in generating the skills required to support the SIPs. As such, the support and growth of this form of education and training has become a major focus of government intervention. The White Paper for Post School Education and Training, reiterates that the DHET's priority is to strengthen and expand public TVET colleges and turn them into institutions of choice for school leavers (DHET, 2013).

3.3.5 Qualifications Developed by the merSETA

Companies in the manufacturing, engineering and related services sector are involved in a range of training and development initiatives that focus on developing the skills of their employees. Such initiatives supplement, but also build on the training that supplies new skills to the sector. This training and development of the current workforce forms a critical source of skills supply. merSETA qualifications registered with SAQA range from NQF Level 1 to Level 5 and the majority of these qualifications are attained through learnerships. The merSETA skills programmes are made up of unit standards or groups of unit standards that belong to these qualifications.

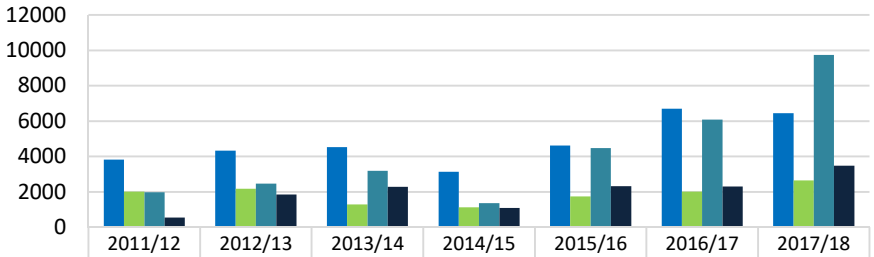
3.3.6 Management and Supervisory Development

Managers and supervisors in the metals, automotive and plastics manufacturing sectors need a combination of industry-specific knowledge and technical knowledge of skills in the functional area to be managed, as well as supervisory and management skills. In most instances managers and supervisors are drawn from within the workforce (and therefore, already have technical and functional knowledge). Further skills development happens through combinations of formal training programmes such as Masters of Business Administration (MBA) programmes as well as short courses and in-service training. The limited supply of particularly black managers means that a focus of this form of training for potential managers from previously disadvantaged backgrounds will remain critical into the foreseeable future. The merSETA's Women in Leadership programme is one such significant example of programmes aimed at developing potential managers and business leaders from previously disadvantaged backgrounds.

3.3.7 Skills Programmes

A skills programme is a structured learning programme that comprises an agreed cluster of unit standards drawn from a NQF registered qualification. A skills programme may specify the sequence in which the unit standards must be achieved and the practical (workplace) experience that forms part of the programme. A completed skills programme therefore constitutes credits towards an NQF-registered qualification. Skills programmes continue to form an important part of the training and development of the occupational groups 'plant and machinery operators and assemblers' and 'elementary workers'. Registration in skills programmes has increased steadily. Between the 2011/12 and 2017/18 financial year, a total of 62 860 learners were registered in skills programmes with 26 893 qualifying during the same period (see Figure 28). This is possibly linked to the new focus on post qualification specialisations or new technology/product related skills training.

Figure 28: Skills Programme Registrations and Completions: 2011/2012-2017/2018 (merSETA QMR, 2018)



	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18
SKILLS PROGRAMME WORKERS ENTERED	3830	4325	4534	3132	4622	6706	6449
SKILLS PROGRAMME WORKERS CERTIFICATED	2008	2177	1300	1124	1739	2008	2653
SKILLS PROGRAMME UNEMPLOYED WORKERS ENTERED	1978	2461	3188	1358	4467	6078	9732
SKILLS PROGRAMME UNEMPLOYED WORKERS CERTIFICATED	551	1856	2278	1089	2329	2302	3479

3.3.8 Adult Education and Training (AET)

Adult Education and Training (AET) is especially prevalent among the relatively large group of lower and semi-skilled. A substantial 19% of the sector's employees are employed as elementary workers and are likely to have formal educational levels below NQF Level 4. A proportion of those employed as plant and machine operators and assemblers (especially older employees) are also likely to have comparatively low levels of formal education and still require ABET, but this is becoming less demanded as the sectors educational levels increase over time – even at lower occupational groups, this is confirmed by sector interviews as well merSETA research. AET is critical to the sector's ongoing need to raise general skills levels and support the acquisition of critical core skills and health and safety skills.

3.4 TRAINING TO MEET THE NEEDS OF INDUSTRY 4.0

The SSP has identified the fourth industrial revolution and skills requirement to meet the needs of advanced manufacturing practices as key drivers for the mer sectors. The SETA is an intermediary mandated to ensure that a competent workforce is developed in line with industry requirements, as such a key focus is the development of the current workforce, this needs to pay cognizance to the current economic situation, align to government strategy and meet employer needs at a practical level. In order to ensure that we develop a workforce that is future ready, the merSETA cannot omit the need to upskill, reskill and (given recent research findings) multi-skill the workforce

Schwab (2015) affirms that technological breakthroughs that have been made in fields such as artificial intelligence, data mining, robotics, the Internet of Things (IoT) and 3-D printing etc. will continue to shape the future of production and ultimately the labour market.

Frey et al (2013) postulates that more sophisticated software technologies are disrupting labour markets by making workers redundant and routine jobs are replaced by machines. The manufacturing sector has been hard hit in this regard, as evidenced through mass retrenchments (particularly in the metal sector) and the need to support industry through support schemes such as the Training Layoff Scheme (TLS) and a merSETA initiative in partnership with labour organisations called the Retrenchment Assistance Programme (RAP). It is critical to assess and take stock of necessary interventions to prepare the workforce for the opportunities offered by the Fourth Industrial Revolution. It is clear that workers must have the ability to be adaptable to new tech systems and remain employable. Therefore we raise the need to understand the concepts of reskilling, up-skilling and multi-skilling.

CEDEFOP (2008) define upskilling as a short-term, targeted training normally provided after initial education or training, and aimed at supplementing, improving or updating knowledge, skills and competences acquired during previous training. Several examples can be drawn in some of the occupations within the manufacturing sectors of the merSETA trades. The specialisation of a motor mechanic is evolving over time because of the technological advancement that are being introduced in the automotive industry through robotics. This can be attributed to the emergence of electric cars, self-driving cars and computer box cars that required additional educational and a technical know-how from the workers. The below table is an example of the vision of future production for a Machine Operator occupation.

Table 14: Example of the vision of future production for a Machine Operator occupation (Source: Workforce of the Future, 2018)

CURRENT TASKS	FUTURE TASKS
– Set up machines using blueprints, adjust settings (speed and temperature), monitor machine for usual sound or vibration and maintain machines – Inter material into machines and remove finished products – Test finished work pieces	– Set up robotic machine workers, with the appropriate setting – Supervise robotic production process, supported by sensor data from the whole production line – Train, maintain and repair robotics to ensure steady quality and productivity

The notion of reskilling entails training that seek to train workers to acquire new skills that give access either to a new occupations or to new professional activities (CEDEFOP 2008, Europe). The merSETA provides a good example of reskilling through its Recognition of Prior Learning programme that links theoretical and practical knowledge in order to attain a recognised trade qualification.

Multi-skilling can be understood as the capability of individuals to perform multiple tasks within their working environment. The exponential technological input in the manufacturing production causes a threat to jobs and occupations that are routine. The merSETA has seen high levels of success across the industry in the millwright qualification due to the fact that it combines fitting and turning with electrical competencies (essentially combining two trades). Given the finding of the primary research references throughout the SSP, particularly the rise in number of small and medium enterprises, there is a need for workers to be able to carry out multiple tasks rather than focusing on a small specialised task or skill. Multiple skills can be viewed as an enabler of workers to perform different tasks at their workplace. In addition however, a broader prospective should focus on the manner in which the fusion between digital, physical and biological space driven by technology shapes the emerging production processes and new occupations. Robotics can be used an example that requires multi-skills because it is a field that integrate engineering and science which include motors, sensors, and programs, control and information processing. Workers with up-to-date knowledge and skills to maintain and use existing robots are positioned on the competitive edge of the labour market.

As the basis to provide the workforce (both the current workforce and new labour market entrants) with access to education that is relevant and contextual in the Forth Industrial Revolution, an ICT course can be added as a pre-requisite module. In addition, Science, Technology Engineering and Mathematics (STEM) continues to be a critical need to address the country's skills problems. According to Paul Dunne, chief executive of Digital Skills Academy, cited in Mail and Guardian (2017) skills that would be in-demand in future globally will include computational thinking, or the ability to manage data processed individually and identify patterns; understanding data analytics, computer programming and design skills, customer-centred digital design skills, new media literacy and digital innovation skills. Some of the skills that will be added to specialised skills within occupations involve soft skills like problem solving, interpersonal skills and analytical skills.

In discussion with sector stakeholders, even high level strategists have intimated that it is difficult to predict what specific occupations will emerge in the near future but they all seem to confirm that there need to be a shift in mindsets in line with the notions of being agile, adaptable and emotionally intelligent as well as the need to ensure that workers are able to grasp concepts of big data analytics, ICT and artificial intelligence which leads to greater efficiencies and improved quality of production. Therefore the merSETA must ensure a focus on both skills gaps (critical and top up skills) as well as technical abilities to carry out

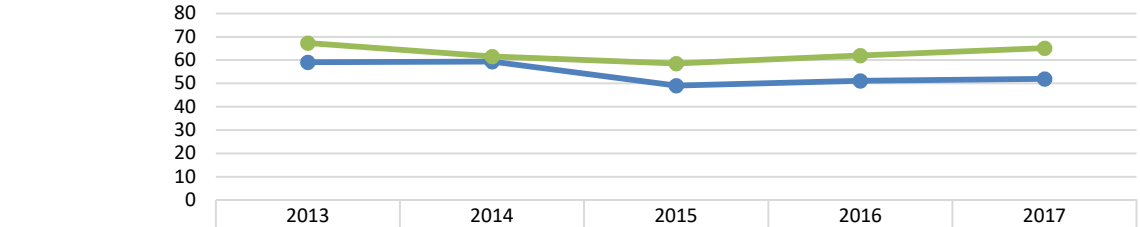
occupational requirements. It was suggested that dual trades could offer workers more possibilities in terms of lateral movements as well as horizontal movements as they navigate their career pathways.

3.5 SKILLS SUPPLY SIDE CHALLENGES

3.5.1 General Education and Training (GET)

The output of the General Education and Training sector to the overall supply of skills for the merSETA sector is important in two key ways. First, the number of learners graduating with mathematics and physical science as subjects at grades that support entry and success at higher education level in qualifications such as engineering has a direct impact on the ultimate availability of these high-level skills for the economy and the merSETA sector.

Figure 29: Percentage Mathematics and Physical Science Pass Rate (Achieved at 30%) (NSC Examination Report, 2017)



	2013	2014	2015	2016	2017
Mathematics	59,1	59,3	49,1	51,1	51,9
Physical Science	67,4	61,5	58,6	62	65,1

When comparing the average pass rates of mathematics and physical science for 2014 to 2015, mathematic declined from 59.3% to 49.1% and physical science declined from 61.5 % to 58.6%. Since the decrease in 2015 for both subjects, the average pass rate for both seems to be steadily increasing with a 0.8% increase for mathematics between 2016 and 2017 and a 3.1% increase between 2016 and 2017 for physical science (NSC Examination Report, 2017). However, despite this increase in average pass rates for the subjects during 2016 and 2017, the total number of learners who wrote these tests decreased (Mathematics decreased by 8% and Physical science by 7%). This is concerning and limits the higher education system from increasing access to and success in many of the high-level scarce-skill occupational qualifications.

3.5.2 Dropout Rates

It has been emphasised that in South Africa, a large number of engineering students tend to drop out of university within the first two years and that by the fourth year, in certain technical disciplines, as few as 10% of the original first year class graduate (Business Tech, 2015). A study conducted by the Engineering Council of South Africa in, found that for the four-year engineering undergraduate programmes offered by HEIs in South Africa, only 30% of first year enrolments graduate after five years while 56% of first year enrolments drop out of university (AEEA, 2016). Dropout rates are also worse among students from historically disadvantaged communities (Stellenbosch University, 2017).

Factors affecting dropout rates are varied and typically include academic factors, financial constraints, insufficient guidance for young people, insufficient tracking and monitoring student progress (especially in the first year), living arrangements and whether they have chosen a course of study that matches their interests and abilities (ILO, 2018; Daily Maverick, 2017). The large number of dropout rates at university, results in a loss of opportunity to these students who

dropout and a loss to the economy of more highly trained workers (Daily Maverick, 2017). To improve the number of learners completing their studies, funding should reward graduate output without reducing the opportunities of learners from disadvantaged backgrounds (The Presidency, 2014).

3.5.3 SIPs Centers of Specialisation (CoS)

The DHET identified thirteen priority trades for the construction of the Strategic Integrated Projects (SIPs) of the National Infrastructure Plan and for other projects. In response to the demand for these trades, the DHET established 26 CoS at selected TVET colleges. The CoS functions as dedicated sites to the delivery of specific occupational qualifications (College of Cape Town, 2018). The CoS Programme is important for the country in that it will produce a new model for training of apprentices and seek to ensure the quality of skills that employers seek are developed through a mandatory public college-industry collaboration (Sacci, 2018).

3.5.4 Competition for Skills with Other Sectors

The manufacturing and engineering sector competes with other sectors to attract engineering graduates whose skills are sought after in other sectors such as construction, finance, ICT, energy and mining etc. The movement of skilled artisans and engineers across the sectors also pose a supply-side challenge for the manufacturing, engineering and related services sector. Attractive working conditions in other sectors may be a pull factor for engineers, technicians, artisans and professionals in the merSETA sector. The decline of the manufacturing sector which has been coupled with declining employment in this sector as indicated in previous chapters has reduced the attractiveness of this sector.

3.5.5 Employability of merSETA Graduates in the Labour Market

There is a general belief that companies prefer the traditional apprenticeship pathways. According to the merSETA 2016 tracer study, 84% of the learners who had completed apprenticeship programmes were employed. Of the 84% employed 49% were retained in full-time employment by their initial employer while 25% were employed full-time by a different employer. About 10% of the learners were employed part-time while 16% indicated they were still unemployed. According to Stats SA's labour market dynamics report 2016, in general people with tertiary level qualification are more readily absorbed into the labour force than those with lower level education (matric and below). This data does not categorically state the absorption rate of TVET (previously FET) band graduates, therefore more analysis is required specifically focusing on mer sector employees.

3.6 PIVOTAL LIST

As mentioned earlier in the chapter, HTFVs are not a good indicator of sector priorities as they tend to represent immediate demand and are subject to economic conditions and company policy, e.g. freezing headcount or expanding portfolios rather than additional recruitment. In addition, they are not an indicator of emerging skills requirements and the need for particular sets of skills within occupations. As such the methodology for identifying occupations on the PIVOTAL list includes findings from primary research projects, stakeholder SSP interviews, recommendations from committee members and management.

The PIVOTAL skills list represents the mer sectors priority skills requirements related to occupations aligned to the OFO, it comprises a ranked list of occupations in high demand. It is drawn up by the merSETA as described above, and considers the following inputs:

- merSETA 2017 PIVOTAL list
- Chamber requirements
- WSP data
- PIVOTAL Skills Plan
- Discretionary data (where occupations are indicated)
- DHET NCAP data

Other national skills lists have been utilised in the past and are still entrenched in the analyses used for the previous skills lists, these include the Top 100 Occupations in High Demand produced by DHET, the SIPs scarce skills list and the Home Affairs list of scarce skills.

The PIVOTAL list gives a national indication of occupations in high demand. merSETA in its mandate as an intermediary continues to support interventions which are intrinsic to ongoing sector need as well as interventions to support innovation, research & development, special projects and national imperatives. This means that merSETA does fund interventions that are not on the PIVOTAL list as per the discretionary grants policy.

Having considered the methodology as explained, the PIVOTAL list is presented below.

Table 15: merSETA PIVOTAL List

Rank	OFO Code	OFO Description	Auto	Metal	Motor	New Tyre	Plastics
1	2017-312201	Production / Operations Supervisor (Manufacturing)		x	x	x	x
2	2017-132102	Production / Operations Manager (Manufacturing)		x	x	x	x
3	2017-653101	Automotive Motor Mechanic	x		x		x
4	2017-311501	Mechanical Engineering Technician	x	x	x		
5	2017-432201	Production Coordinator	x	x			x
6	2017-653303	Mechanical Fitter	x	x		x	
7	2017-684905	Vehicle Body Builder	x		x	x	
8	2017-643202	Vehicle Painter	x		x	x	
9	2017-214102	Industrial Engineering Technologist	x	x		x	
10	2017-672104	Electronic Equipment Mechanician	x	x			x
11	2017-441903	Program or Project Administrators	x	x			
12	2017-653306	Diesel Mechanic		x	x		
13	2017-832901	Metal Engineering Process Worker	x	x			
14	2017-671101	Electrician		x		x	
15	2017-718905	Automated Machine Operator		x	x		
16	2017-721901	Product Assembler	x	x			
17	2017-832910	Component Fitter			x	x	
18	2017-718905	Engineering Production Systems Worker		x	x		
19	2017-714101	Rubber Production Machine Operator				x	x
20	2017-242210	Business Administrator		x		x	
21	2017-334102	Office Administrator		x			x
22	2017-684305	Quality Controller (Manufacturing)		x			x
23	2017-226302	Safety Health Environment and Quality Practitioner		x		x	
24	2017-714204	Plastics Production Machine Operator (General)			x		x
25	2017-122102	Sales Manager	x		x		

The envisaged outcomes of the interventions are dependent on demand through the grants application process. For the most part PIVOTAL interventions point to full qualifications in instances of a bursary, apprenticeship or learnership (although the learnership model also lends itself to modular learning in terms of acquiring skills sets). Skills Programmes would result in a part qualification and does give support to the finding of a higher need for workers with skills sets. All PIVOTAL interventions result in a full or part qualification aligned to NQF.

3.7 CONCLUSION

This chapter reflects on the categories of skills development needs in the merSETA sector that have been alluded to in the previous chapters. In respect of the specific skills that need focused attention, the PIVOTAL list of occupations in high demand is also presented in this chapter as well as skills gaps that need to be considered. Overall, a range of factors will impact on the future of skills supply and demand in the sector. These factors include future growth of the economy, the implementation of interventions aligned with national strategies including transformation, a demand for higher level skills in the sector and the demand for better the quality of skills supplied including skills gaps. Interventions cannot only take into consideration skills that are listed in the PIVOTAL list of occupations in high demand, but the merSETA must also support skills that keep the sector going as well. Future skills must be researched more closely and interventions tailored to meet these needs must be implemented through special projects and innovations aimed at meeting industry needs.

Automation and technological advances require re-skilling, up-skilling and multi-skilling. Stakeholders have highlighted the demand for interventions fit for provision of skills for the future, but at the same time the sector must produce skills now for skills that are becoming redundant. Ultimately, merSETA must become ever more innovative regarding skills provision, taking on for itself agility and adaptability by better servicing both learners and employers. This requires leadership with respect to unpacking issues highlighted in this SSP and deliberating on acceptable approaches through current interventions and innovations as well as identifying key partnerships or projects to support sector demands.

Finally, there is need for up-scaled efforts to secure shared and inclusive growth, transformation of ownership and management control and empowerment through decent jobs, especially in labour-intensive sectors.

4 PARTNERSHIPS

The purpose of this chapter is to report on partnerships, assess the existing partnerships, highlighting successes and challenges and the approach to identify potential new partnerships. The basis on which partnerships are established stems from the NSDS III. Partnerships inherently implies that partners share the responsibilities of fulfilling the objectives of the agreement. Ultimately partnerships culminate in improvements in terms of efficiency, quality and impact of skills development and training which produces a skilled and capable workforce.

4.1 EXISTING PARTNERSHIPS AT THE MERSETA

The partnership model is one that has been adopted by all SETAs in an effort to not only fulfil the SETA mandate, but also to work and collaborate with key role players in the Post School Education and Training landscape, employers in the sector and civil society to promote skills and competencies in the sector, assist the sector to be more competitive as a result of improved skills and aid government imperatives of transformation, poverty reduction and equality.

The guiding principles for partnerships has stemmed from the NSDS lll, the White Paper for Post School Education and most recently, the National Skills Development Plan. The NSDP states that skills development efforts should:

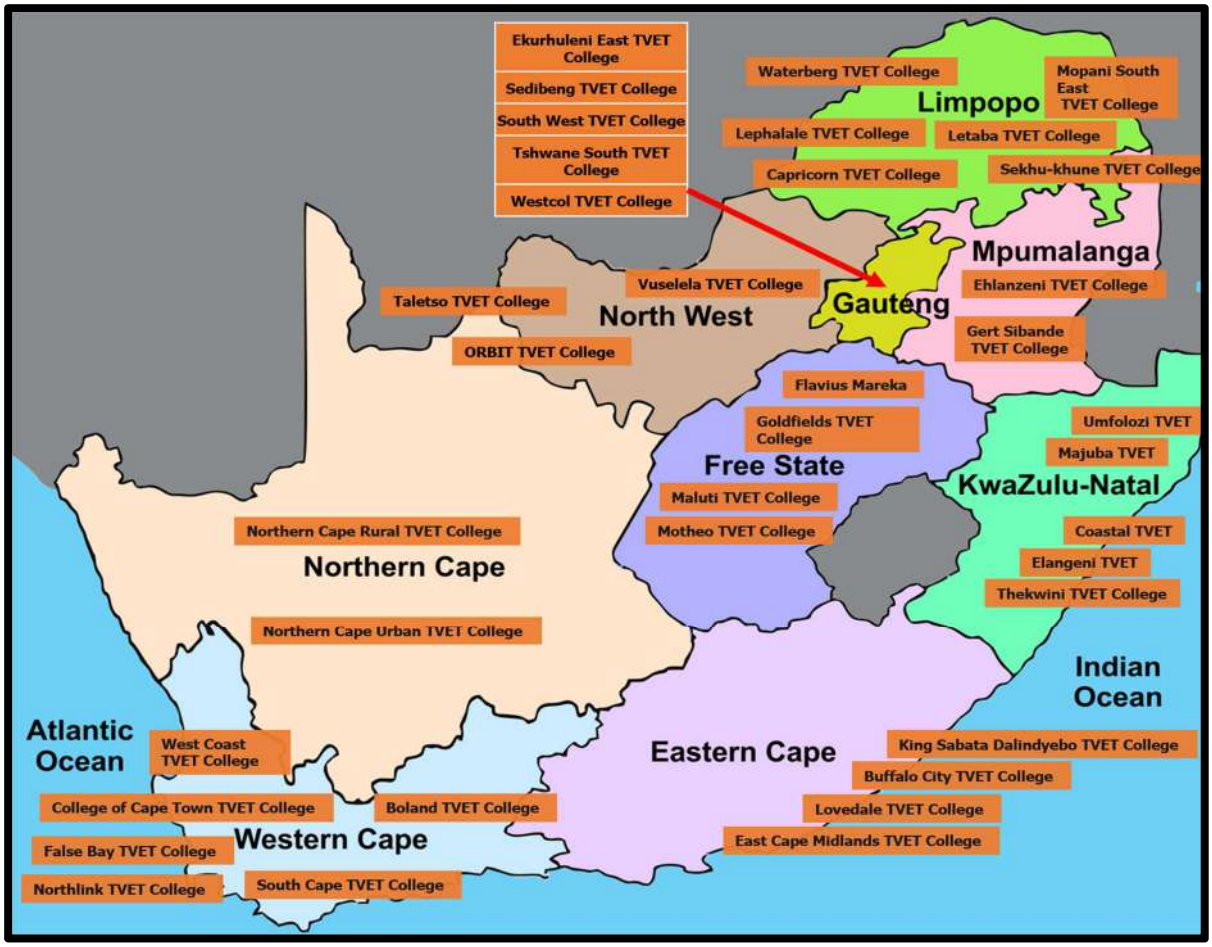
- Endeavour to produce an integrated post schooling system
- Contribute to wider national objectives

4.1.1 TVET College Partnerships

In order to strengthen and expand TVET colleges and turn them into institutions of choice for school leavers as highlighted in the White Paper, merSETA continues to strengthen its partnerships with TVET colleges. Partnerships with TVET colleges rests on two pillars, firstly these partnerships promotes the quality and responsiveness of TVET teaching, learning and assessments. Second, these partnerships are established to facilitate access to learning opportunities so that TVET graduates can either gain artisan status or become employable, this includes Recognition of Prior Learning (RPL).

The merSETA has entered into partnerships with 38 TVET colleges and has almost 70 partnership agreements. The majority of these partnerships focus on learning pathways towards learners progressing to become trade-tested artisans. The partnerships have a national TVET college footprint in all nine provinces, inclusive of colleges in rural areas. On completion of the National Vocational Certificate (NCV) in engineering studies, learners often have difficulty finding work due to a lack of work-integrated learning (WIL) during their studies. merSETA supports the NCV4 to artisan programme, partnering with TVET colleges to supplement institutional learning, participate in WIL qualify for trade testing. The aim is to qualify NCV learners as fully-fledged artisans over a period of 24 months. The merSETA supports lecturers at TVET colleges through several of the partnership agreements, aimed at the professional development of the lecturers in engineering studies. The support provides lecturers, who are not trade-tested artisans, to spend a period of 18 months in merSETA industries concluding in a trade test, there have been some challenges in this initiative which is explained later in this chapter. Further TVET partnerships include training on a spray paint simulator which is part of future skills training using scenarios on a simulator prior to entering the workplace.

Figure 30: Map of TVET Colleges who have Partnership Agreements with merSETA



4.1.2 National and Provincial Government Partnerships

merSETA has entered into partnerships with national and provincial government entities in order to align to national priorities and assist with regional skills development interventions. Focus areas of these partnerships include the following:

- Supporting youth to attain qualifications in the trades or engineering
- Supporting efforts of the UIF to assist employees whose employers are in distress to attain skills that will be worthwhile should they end up being retrenched
- Supporting the Department of Correctional Services to provide skills to inmates and offenders awaiting parole
- Supporting public works programmes for learnerships and apprenticeships in the merSETA scope of coverage
- Partnering with NSFAS to offer bursaries to underprivileged youth in the field of engineering
- Partnering nationally with the Office of the Premier in most provinces to provide skills opportunities through apprenticeships, learnerships and skills programmes

Ultimately, national partners assist in the areas of skills development, transformation, poverty reduction and social justice. These partners in collaboration with the merSETA are able to reach more needy beneficiaries and give skills opportunities to people across all provinces. A summary of these partnerships is provided in Table 16 below.

Table 16: National and Provincial Government Partnerships

PARTNER	PROVINCES	SCOPE OF WORK
Dept. of Basic Education MP	MP	Providing opportunities for unemployed learners on trade related learning programmes
Dept. of Public Works National	National	Apprenticeships and Learnerships ending in a trade test
Dept. of Basic Education GP	GP	Funding grade 120 learners on technical programmes to access apprenticeships through technical schools in rural areas
Dept. of Correctional Services	EC, FS, NC, GP, KZN,	Funding of inmates and offenders awaiting parole on skills programs
Dept. of Economic Development & Tourism	WC	Training and development of artisans
Dept. of Public Works LP	LP, MP	Apprenticeship training
Dept. Small Business Development	National	Internships and work experience. Skills Programmes. Support for cooperatives and entrepreneurs
NSFAS	National	Bursaries in engineering and related fields
Office of the Premier	FS, KZN, LP, NW, WC	Supporting Apprenticeships, Internships, Skills Programmes, Candidacy and small business development in the manufacturing and engineering sectors
Saldanha Bay IDZ	EC	Skills programmes
Dept. of Labour, UIF	National	Training layoff scheme and Skills Development Projects for unemployed youth and retrenched workers

4.1.3 Partnerships with Higher Education Institutions

The merSETA has entered into partnership agreements with Higher Education Institutions (HEIs) for numerous purposes, these include inter alia qualification development, research related partnerships, delivery of operational targets through bursaries related to the engineering and manufacturing sectors with a focus on transformation and empowerment of previously disadvantaged individuals who would otherwise not have the opportunity to further their studies. To this end, the merSETA works with the HEIs to support undergraduate, post graduate and doctoral candidates. Importantly, candidates on post graduate and doctoral bursaries centre their research on topics related to the mer sectors.

Critical to these partnerships as per the White Paper, is the role of SETAs in bringing the education fraternity and industry closer together. From a national perspective this bodes well for sector development as well as for critical skills development in areas of research development and innovation. As a SETA grounded in vocational training, these partnership also leverage support for improving skills of lecturers in TVET colleges. Table 17 below, provides a brief summary of merSETA's HEI partnerships.

Table 17: Partnerships with Higher Education Institutions

UNIVERSITY NAME	SCOPE OF THE PARTNERSHIP
Cape Peninsula University of Technology	Placement of learners for WBL and experiential learning
	Wind turbine qualification
	Bursaries related to the manufacturing and engineering sector
Central University of Technology Free State	Placement of learners for experiential learning
	Development of TVET Lecturers
	New generation career development tools
	Bursaries related to the manufacturing and engineering sector
Durban University of Technology	Industry based research through post graduate studies
Mangosutho University of Technology	P1 and P2 student support
Nelson Mandela University	Bursaries related to the manufacturing and engineering sector
	Development of School Learners & Teachers in Maths & Science
	Future manufacturing skills project
	Research project related to NC(V)4 to Artisan

UNIVERSITY NAME	SCOPE OF THE PARTNERSHIP
	Skills & Enterprise dev for SMME's
	TVET Research
	Chair in Engineering
	Support for TVET-Marine programmes
	Youth Livelihoods qualitative research focusing on how youth sustain themselves through informal work in the manufacturing sector
North West University	Advanced Manufacturing, Electric Car Development, Composites and lightweight structures, Improving Access programme
Tshwane University of Technology	Bursaries
	Qualification Development
	Research Chair in Manufacturing Skills
University of Cape Town	Internships and experiential learning
	Bursaries relating to the engineering & manufacturing sector
UNISA	Career development framework
University of Johannesburg	Bursaries for under graduate, post graduate and doctoral studies in mechanical, electrical and industrial engineering
	Student placements for WBL in small businesses
University of Pretoria	Bursaries in engineering and manufacturing related fields
University of the Free State	Training to vocational teachers to improve the quality and increase the number of SET entrants. Research and Development of Green Building mechanical use Index, In-service teacher training to stimulate critical technical habits of minds Provision of micro-botics classes at high schools
University of the Western Cape	Support for postgraduate studies and supervision
	Development of TVET lecturers
	Stakeholder communication enhancement project
	Training assistance & tutors for expanded curriculum programme
University of the Witwatersrand	Funding of 6 under-graduate Thusanani bursars for 2017
	Engineering Graduate placement, Breaking Institutional Boundaries project, Tutorial Project, part Time engineering Learning pathways access, Targeting Talent programme
	Priority skills as identified by merSETA SSP and WITS
University of Venda	Empower rural learners in Science, Engineering and Technology
	Funding of various innovation, research and support programmes
Vaal University of Technology	Bursaries related to the manufacturing and engineering sector
	Skills & Enterprise development for SMME's
Walter Sisulu University	WSU turnaround strategy in support of the Minister of DHET's five key priorities.

4.1.4 Social Partnerships

merSETA has established partnerships with civil society, labour unions and community based organisations for worker education. These partnerships require collaboration between the merSETA, social partners, private and public training providers. These include:

- Worker training (shop steward and legislative training) and bursaries in partnership with labour unions affiliated with the merSETA including NUMSA, UASA, MISA and Solidarity
- Cooperatives support and training
- People with disabilities are supported through training by partnering with nonprofit organisations
- Future skills training initiative for operators and unemployed learners which entails the upskilling of workers and unemployed at operator level in partnership with the EC Automotive Industry Forum and Mercedes Benz

4.1.5 International Partnerships

merSETA has partnered with international agencies in an effort to keep abreast of developments in key sectors to assist in the development of national apprenticeship training as well as experiential learning. There are currently two such partnerships:

- ***British Council***
    - Partnerships between SA and UK TVET institutions for leadership development. Fifteen colleges have already benefitted from this partnership.

- ***Chinese Culture and International Education Exchange Centre***
    - This program was implemented in 2017 and placed learners in Chinese workplaces for workplace learning. This exposed the learners to what is considered a high tech, structured work environment, these learners were then able to bring their experiences back to South Africa.

4.1.6 Innovation and Applied Research Partnerships

With the advent of Manufacturing 4.0 and the notion of a circular economy, research and development is required to keep merSETA stakeholders at the forefront of skills and skills interventions that keep pace with an ever changing working environment. To this end merSETA is developing two application based products to assist with career awareness and an ICT enabled apprenticeship model. The ICT enabled application for apprenticeships will provide increased access to apprenticeships for unemployed youth and those in the informal sector.

4.1.7 Chamber Research Partnerships

Research is critical to skills planning and merSETA considers its Chambers as partners in its efforts to provide better interventions for each of the sub-sectors. As such the merSETA makes a research grant available to industry partners, managed through the Chambers to conduct sector research. The following projects have been implemented in the past year:

- **Plastics Chamber**: "What is the shortfall or lack of plastics technicians and plastics engineers in South Africa and what can be done to address the problem?"
- **Metal Chamber**: Benchmarking Study of Models of Training Lay-off and Retrenchment Mitigation Schemes.
- **Motor Chamber**: Motor Industry Skills of the future.
- **New Tyre Chamber**: Career Path Development in the New Tyre Industry (2018-2019).

4.1.8 New Partnerships

New partnerships require additional attention through an integrated formalised approach to unpacking the key areas of development which require interventions through a formal partner relationship. Key committees within the merSETA have highlighted the need to better align with the White Paper on partnerships and also align with partners in technical schools and community colleges.

- merSETA will continue to identify key collaborators in alignment with key national strategies, drivers of change within the sectors and special attention needs to be paid to the requirements of Industry 4.0 and the role of our stakeholders in the circular economy.
- merSETA will build support for small, cooperative and informal sector enterprises through skills development through partnerships with government agencies and civil

society, particularly with respect to addressing youth unemployment and empowerment of communities in townships and rural areas.

- merSETA will also ensure that it commits to the supporting of engineering candidates to reduce the difficulties in becoming registered engineers through strategic candidacy support by working with the Engineering Council of South Africa (ECSA).

4.2 PARTNERSHIP SUCCESSES

The role of partnerships in enabling the merSETA to meet and exceed some of its skills development goals cannot be overemphasised. Some of the successes from past and current partnerships are highlighted below:

- **Improved TVET Leadership**
  Collaboration with partners such as the British Council have borne fruits in terms of leadership within the TVET Colleges that participated. In addition, merSETA has in the past assisted TVET colleges on improved utilisation of workshop space as well as recognising the importance of industry buy-in with respect to the level at which training of artisans should be pitched. Essentially, leadership should be committed and strive to continuously improve results for their institutions, the learners and communities they serve.

- **Developing capacity of TVET lecturers**
  TVET capacity to deliver better training was aided by supporting lecturers on post graduate diploma programmes at higher education institutions. These partnerships are proving to be very worthwhile as the SETA continues its work in this area.

- **Increasing artisan development**
  merSETA has always sought mechanisms to improve and expedite artisan training to make good quality artisans available to the labour market, this is evidenced through the AATP, the Dual System Artisan Programme and the NCV to apprenticeship programme.

- **Improved throughput of learners on merSETA programmes**
  Completion rates have been increased due to a strong learner support system formed as a result of increased collaboration due to strong partnerships between the merSETA, industry, TVET colleges and Higher Education Institutions.

- **Placement of learners and absorption into employed positions**
  The merSETA assists TVET colleges in placing learners by linking them directly with employers that provide workplace learning spaces. There is also evidence of learners being retained as employees by many of the companies at which they are placed.

- **Increasing social partner collaboration**
  Partnerships have improved stakeholder participation by engaging industry associations, employer associations, organised labour, and sector bargaining councils to address bottlenecks in the system and work towards the mutual goals of increased levels of co-ordination and efficiency.

4.3 CHALLENGES EXPERIENCED WITH PARTNERSHIPS

Partnerships have presented the merSETA with some challenges that are worth mentioning. Through various interventions that will be discussed in the following section, merSETA has come up with innovative ways and best practices for dealing with these challenges. The challenges identified include:

Table 18: Partnerships and Mitigation Strategy

PARTNERSHIP CHALLENGES	EXPLANATION	MITIGATION
Unintended consequences of partnerships	Lecturer development within the TVETs have at times resulted in those lecturers who were upskilled making unrealistic demands on the employers (TVETCs).	**The merSETA endeavours to ensure the following:** • **Good project management practices** such as clear project conceptualisation, project finance management, project risk management and project time management are important to ensure the success of partnerships. • **Qualified project leaders** should be identified along with a steering committee to ensure the partnership stays on track. • Partners should demonstrate **commitment to the envisioned outcomes** of the partnership before signing the agreement. • **Monitoring and evaluation** is an important element that needs to be built into all partnership agreements. • **Recruitment of learners** on partnership programmes requires adequate attention, the training institution should have mechanisms in place for learner support. • The **role of industry** in partnerships needs to be emphasised as it is the industry that provides workplace learning opportunities. • MerSETA has put in place an agreement with the Chambers that inputs from employers and worker organisations in industry are acquired upfront during **planning**.
Unrealistic expectations in terms of timelines and budgets	Learners are not always adequately suited to the programmes. Often, learners take up an opportunity because they have no alternative, as a result these learners are not successful. Alternately, the learner may take a longer time to complete his/her programme resulting in additional expenditure. The SETA cannot blame its partners alone - capacity must be developed internally to better understand what is possible within a given time frame and budget.	
Inability of partners to justify tranche payments with evidence	Well-constructed partnership agreements will have a set of deliverables attached to a payment, however partners may struggle to provide evidence that work was adequately completed.	
Poor monitoring and project management	This has resulted in some projects failing to be completed on schedule without any valid reason, poor project reporting, and poor implementation and monitoring of projects.	
Poor capacity of the TVET college or HEI to support and supervise the learners	Lack of the availability of suitably qualified Professors (PhD/DPhil), senior lecturers to lead the programmes. Committing to too many learners on a programme with limited capacity to supervise or teach impedes learner progression and success.	
Difficulty in recruiting qualified candidates into HEI programmes	This is mainly due to limited capacity to avail suitable qualified professors as well as parameters placed on the institution to deliver tailored outputs for the mer sector.	
Institutions are flooded with requests for partnerships and therefore over-commit	The establishment of SETA funded research chairs as well as a multitude of other projects with donors reduces capacity to deliver good quality outputs in time.	

4.4 CONCLUSION

For the merSETA, partnerships are a mechanism for achieving its strategic objectives and to deliver high quality services to its stakeholders and learner beneficiaries. merSETA has established through partnerships a national footprint for implementing skills development initiatives contributing towards the revitalisation of technical-vocational education and training (TVET) which includes improving the competence of lecturers, trainers and teachers to provide work relevant skills intervention. merSETA has also put in place partnerships to increase research capability for TVET and improved skills planning. There has also been a demand for innovation research and development skills for businesses operating in the mer sectors, as such the SETA has partnered with HEIs to award post graduate scholarships at Masters, PhD and post doctorate levels. The research capabilities of engineering faculties within HEIs has also proved to be fruitful. The merSETA agreements support local networks between industry, government and post school institutions resulting in the provision of work experience and work integrated learning opportunities for TVET and HEI students as well as enabling engagement between workplace trainers and occupational experts and college/HEI educators.

5 SKILLS PRIORITY ACTIONS

This chapter summarises the key economic, labour market, and skills change drivers that should inform the merSETA skills development priorities. It also provides a set of skills development priority actions from which realistic and achievable plans can be developed and implemented. It must be noted that these do not represent a detailed strategic or operational plan as there are other planning instruments that will take the recommended actions here-in into such plans.

5.1 SUMMARY OF FINDINGS FROM PREVIOUS CHAPTERS

merSETA manufacturing industries in the metal and automotive and motor sector continue to produce high volumes. However, they show slowed production (manufacturing) growth whereas the plastics, new tyre and components manufacturing seem to be on an upward trend. Sales figures for metal, automotive manufacturing and motor also show high volumes, but with metal and automotive slowing whereas, plastic, new and motor retail show steady growth. Motor and metal industries have the highest employment. However, motor, auto and plastics are showing to have higher employment growth with metals showing the most employment decline. Large enterprises have the majority share of employment, just over 50% whilst small and medium sized combined account for close onto 45% of employment. The informal sector seems to be growing with close to 3 million South Africans working in the informal sector, of which 41% are individuals working in the trades in industrial activity related to motor, plastics (recycling) and metals. Workers in the informal sector tend to be youth, most with qualifications lower that matric or college certificates. In the formal sector, the majority of employees are semi-skilled and low skilled (operators and elementary workers), the largest proportion Black African and about 50% of whom are below 35 years of age. Demographics in terms of race, gender and disability show some improvement for trades and professional, but the managerial category continues to be substantially white and male. Automation of production processes is affecting the employment opportunities of operators and elementary workers (45%), a key factor for merSETA to take into account when planning skills development for the current workforce so as to stem job losses. Transformation of the mid-level, professional and managerial occupations remains an imperative.

The major skills change drivers are the circular economy, advanced manufacturing and industry 4.0, and re-industrialisation and localisation. The circular economy provides opportunities for manufacturing recycling for new businesses and is in line with Government strategies for growing the blue and green economies, SMEs and local manufacturers. Although South African manufacturing is still to fully embrace advanced manufacturing (AM) and Industry 4.0, clearly South African manufacturing needs to embrace them to be globally competitive. Skills that will be needed should be developed now in order to leverage the technological advances of AM and industry 4.0, especially with respect to youth who are already exposed to the digital technologies of AM and Industry 4.0. AM and Industry 4.0 provide opportunity for attracting young people into manufacturing industries which traditionally have been viewed as unattractive due to the stigma attached to manufacturing occupations of trades/artisans. Government strategies for reindustrialisation and localisation point to the importance of skills as a key lever for skilled production workers, artisans, technicians, engineers who can also operate within the world of digital technology. Digital technology also provides opportunities for innovation with regard to education and skills development for both the currently employed and new entrants. The National Development Plan encompasses a range of government growth and development strategies for which merSETA requires to implement skills development initiatives.

The manufacturing industries continue to show that artisans, technicians and engineers as occupations in high demand. In addition, automation and other technological disruptions in production processes indicate the need for a flexible, agile adaptable workforce that has ICT skills and other skills such as problem solving, ability to work in a team, collaborate or lead. The post schooling education and training delivery system, and merSETA in particular should position learning programme development and delivery to support the occupations in high demand and emerging skills gaps resulting from automation and technological disruptions for both current employees and new entrants.

5.2 RECOMMENDED SKILLS PRIORITY ACTIONS FOR MERSETA

For the merSETA to remain relevant to its merSETA industries, it should be guided by the need to contribute to the development, expansion and diversification of its manufacturing industries. The merSETA should position itself as an intermediary that brings to bear employer, worker, government and education and training institutional capacity to achieving skills for the growth of its manufacturing industries. Guiding principles for engagement and delivery include:

Evidence based decision making: Skills development should be based on credible research evidence.

Consultation and good governance: merSETA should maintain trust and confidence through consulting and providing opportunities for external and internal stakeholder inputs/intelligence and ensure clear role delineation between the AA, its Committees and the executive management for the execution of the AA strategy.

Partnership: merSETA should continue to use partnerships as important vehicles for: exploring, developing and implementing innovation solutions and large scale programmes/projects; building its knowledge base; and, advancing and modernising its skills development system.

Centrality of work integrated learning (WIL): WIL is core to learning within and for merSETA occupations and skills.

Utilisation of education, training skills development infrastructure of PSET provisioning system: merSETA should support and develop the PSET provisioning infrastructure (workplace, community colleges, TVET colleges, HEIs, skills development providers) so that it can expand the reach of its services.

Differentiated response: There must be recognition of regional and enterprise differentiation.

5.3 RECOMMENDED ACTIONS TO GUIDE MERSETA PLANNING AND SUPPORT NATIONAL STRATEGIES

The strategic priority actions that should guide further planning are summarised below.

Automation of production processes impacting on current employees especially operators and elementary workers calls for a survey of workers' skills needs so as to inform the reskilling and upskilling interventions to be implemented to minimise job losses.

Transformation remains a key imperative for skills development of managerial, professional, technician and artisanal occupations with regard to race and gender, and for all occupational groups with regard to people with disability.

Informal businesses need to be supported to become formal registered business, such as small enterprises or cooperatives. The merSETA should work together with other state agencies to develop an ecosystem approach whereby support includes not only training, but also access to: finance, operational efficiency support, markets and value chains of merSETA industries.

Future skills for circular, advanced manufacturing and Industry 4.0 should be researched to inform the development of new career pathways and skills development responses that will: prepare current employees for changing careers; attract and skill youth for new occupations and careers; and, skill business owners especially small and medium sized enterprise so that they are enabled to take up opportunities in growth areas such as plastics, motor, new tyre, metal renewable energy and chemical; which are also supported by incentives and schemes of different government strategies for re-industrialisation and localisation IPAP and SIPs being examples of such strategies.

Government strategies skills needs must be unpacked. The merSETA must engage the responsible departments with the view to implementing mega skills development projects for the strategies, inclusive of those for rural development and the urban economically marginalised.

Curriculum research and development based on deep understanding of changing production processes must be implemented to steer the delivery of education, training and skills development for merSETA industries.

Career development, advice and support for the flexible labour market implied by the advent of advanced manufacturing and Industry 4.0 must be put in place to empower current and new entrants manage their career aspirations and development.

5.4 CONCLUSION

Skills development priorities identified by the merSETA represent the culmination of the sector analysis and stakeholder-consultation processes and are intended to guide the merSETA's strategic actions. The implementation of these skills development priorities should link to the range of inter-related strategic issues that arise from the sector analysis. The importance of appropriate local and regional level skills development to support the informal, emerging and SME sector has been noted.

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