Geared for Growth

South Africa's automotive industry masterplan to 2035

A report of the South African Automotive Masterplan Project

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Contents

Acronyms used in this report

AGOA	African Growth Opportunities Act
AIEC	Automotive Industry Export Council
APDP	Automotive Production Development Programme
ASCCI	Automotive Supply Chain Competitiveness Initiative
ASEAN	Association of Southeast Asian Nations
BBBEE	Broad Based Black Economic Empowerment
BMA	Benchmarking and Manufacturing Analysts
CBU	Complete Built Up
CKD	Completely-Knocked Down
DED	Department of Economic Development
dti	Department of Trade and Industry
DST	Department of Science and Technology
EEV	Energy Efficient Vehicle
EU	European Union
EV	Electric Vehicle
FTA	Free Trade Agreement
GCC	Gulf Cooperation Council
GDP	Gross Domestic product
GFC	Global Financial Crisis
GVA	Gross Value Added
GVC	Global Value Chain
HEV	Hybrid Electric Vehicle
ICCT	International Council on Clean Transportation
ICE	Internal Combustion Engine
IDC	Industrial Development Corporation
IPAP	Industrial Policy Action Plan
LCV	Light Commercial Vehicles
M&HCV	Medium and Heavy Commercial Vehicles
MERCOSUR	Southern Common Market
MIDP	Motor Industry Development Programme
MNC	Multi National Corporation
NAACAM	National Association of Automotive Component and Allied Manufacturers
NAFTA	North American Free Trade Agreement
OEM	Original Equipment Manufacturer
OICA	Organisation of Motor Vehicle Manufacturers
PHEV	Plug-in Hybrid Electric Vehicles
PTA	Preferential Trade Agreement
PV	Passenger Vehicles
R&D	Research and Development
SAAM	South African Automotive Masterplan
SAAMP	South African Automotive Masterplan Project
SACU	South African Customs Union
SADC	Southern African Development Community
SANRAL	South African National Roads Authority Limited
SSA	Sub Saharan Africa
SUV	Sports Utility Vehicles
SWOT	Strengths, Weaknesses, Opportunities, and Threats

Foreword

Commissioned by the Department of Trade and Industry (the dti), this report presents the South African Automotive Masterplan to 2035. It was initially compiled in November 2016 and has been released for public consumption on completion of the Masterplan project in December 2018. The report summarises the findings from the comprehensive research completed as part of the South African Automotive Masterplan project, and presents the aspirational vision, objectives, and strategic framework agreed upon by industry stakeholders to optimally develop the South African automotive industry through to 2035.

As the service provider commissioned to complete the South African Automotive Masterplan project, Benchmarking and Manufacturing Analysts SA (Pty) Ltd (B&M Analysts) is responsible for the content presented in this report. The authors acknowledge that a team of consultants contributed to its compilation, although all omissions or errors are those of the authors alone. The input of the Masterplan's Industry Reference Group and Executive Oversight Committee that reviewed the draft report is also gratefully acknowledged, while special mention needs to be made of the support received from Mr Mkhululi Mlota, the Chief Director of the Automotive Desk at the dti.

Whilst every care has been taken to ensure the accuracy and integrity of the information and analysis presented in this report, B&M Analysts, its staff members, and associates, take no responsibility whatsoever for decisions derived from its content.

Introduction

The automotive industry is South Africa's most important manufacturing sector. Approximately one-third of value addition within the domestic manufacturing sector is derived either directly or indirectly from vehicle assembly and automotive component manufacturing activity, positioning the industry and its broader value chain, as a key player within South Africa's industrialisation drive. The importance of the industry to the South African economy is crystallised in the national government's Industrial Policy Action Plan (IPAP), which recognises its importance as a critical sector with cross-cutting linkages across several industries and services, contributing to various economic development imperatives.

The domestic automotive industry has undergone a pronounced transformation since the advent of democracy in South Africa. It is now dominated by multinational firms and is fully integrated within global value chains. It is characterised by substantial levels of exporting and importing and has proven itself capable of producing vehicles to the highest international standards. Several South African vehicle assembly plants and their domestic component manufacturers have received international accolades for the quality of their outputs, clearly demonstrating the capabilities of the industry.

In recognition of these capabilities, the industry exported 333,802 vehicles in 2015 worth R101.9bn, along with R49.6bn in automotive components. These exports were delivered to over 140 countries, with vehicle exports alone constituting one of South Africa's most important trade categories. The manufacturing segment of the automotive industry presently employs around 112,000 people across its various tiers of activity (from component manufacturing to vehicle assembly); which, combined with the industry's strong multiplier effect, leads to it being responsible for around 320,000 jobs in the South African economy (or 2.0 to 3.5% of total employment depending on data source). As a responsible employer, the quality of jobs in the automotive industry is also considerably higher than the national average, while national bargaining council structures ensure a highly formalised labour market environment.

Notwithstanding the enormous strides made by the South African automotive industry, it has not been immune to the travails of the global automotive industry as brought about by the Global Financial Crisis (GFC) in 2008, nor the difficulties being experienced in the South African market because of weak economic growth. The domestic market has stagnated since its vehicle consumption peak in 2006, while domestic market imports have surged as global vehicle assemblers have aggressively sought markets to fill their production capacity. This has constrained opportunities within the South African automotive value chain, with 73% of the domestic passenger vehicle market and 19% of the light commercial vehicle market being supplied by imports in 2015. Gross Value Added in the automotive industry has consequently grown less impressively than export growth would suggest, with aggregated domestic vehicle production growing at an average of 3.6% from 1995. This has moderated employment levels in the industry, stifled the deepening of the industry's technology base, and reduced local content in South African assembled vehicles (to only 38.7% in 2015).

The South African automotive industry consequently represents continuous work in progress. At a national policy level, it has been heavily supported by the national government in the form of the Motor Industry Development Programme (from 1995 to 2012) and presently the Automotive Production and Development Programme (to 2020), while also being increasingly exposed to international competition through an aggressive tariff reduction schedule. In addition, firms can

offset vehicle and component duties through duty rebate mechanisms that have been structured to support both the competitiveness and sustainability of the domestic industry. To advance the supply side capabilities of the industry, national government support has been extended to the establishment of a national Automotive Supply Chain Competitiveness Initiative (ASCCI), in collaboration with industry, while various provincial and local governments have also extended various support to the automotive firms operating in their jurisdictions.

The South African automotive industry faces a clear set of challenges. It is confronting a range of global technology, environment, and competitiveness headwinds, while simultaneously dealing with depressed domestic and regional market conditions. At the same time, the industry exhibits substantial potential. At only 0.68% of global vehicle production and operating in a domestic and regional market with low levels of vehicle ownership and a growing middle-class consumption base, the future of the industry should be extremely bright. It is within this context that the South African national government's Department of Trade and Industry (the dti) took the unprecedented step of commissioning a detailed study and associated project to formalise a South African Automotive Masterplan to guide the development of the South African automotive value chain through to 2035.

In recognition of the central importance of the domestic automotive industry to the future growth of the South African economy, the dti commissioned the development of a South African Automotive Masterplan project. The project commenced in April 2016 and was completed in November 2018. The first three parts of the project represented the contextual frame to the completion of this Masterplan document. The first part analysed major global automotive trends impacting on the performance of the South African automotive industry and considered the automotive policies of 12 economies attempting to support their domestic automotive industries in the context of global industry developments. The second part built on the comparative policy analysis by exploring in detail the automotive policies and associated industry development trajectories of four economies. The third part then analysed the status quo of the South African automotive industry and considered its positioning globally. These three parts resulted in the compilation of three technical reports that have been summarised in this Masterplan report. Importantly, all the findings presented in the technical reports were shared with key industry stakeholders through 2016 and robustly debated to ensure their accuracy and veracity in respect of unpacking key trends and comparative experiences.

A further key component of this report is derived from industry engagements that were completed after the finalisation of the research-based phases of the project: namely industry stakeholder inputs from a set of regional automotive workshops completed in the later part of 2016. At these workshops, industry stakeholders were asked to engage with the findings from the research phases of the South African Automotive Masterplan (SAAM) project, and through a set of brainstorming activities to define a vision and associated set of key objectives for the South African automotive industry through to 2035. Workshop participants were also asked to define key actions that they believed were central to the realisation of the objectives identified. The five regional workshops led to the completion of 13 industry inputs into the Masterplan process, while the authors of this report also entered into substantial dialogue with industry participants (and additional stakeholders) to define an industry-led South African automotive vision, and associated set of objectives.

The South African Automotive Masterplan as presented in this report is intentionally aspirational. It is meant to provide the foundation on which the country's post-2020 policy, as announced by Minister Rob Davies in November 2018, is created. The intention is for all future policy considerations to be debated in the context of their likely impact on the realisation of the vision and objectives articulated in this Masterplan. Importantly, while the SAAM is intentionally aspirational, it is also intended to be realistic in respect of the industry's growth and development potential

through to 2035. In identifying the industry's vision and objectives to 2035, the South African automotive industry itself has recognised the targets that can be achieved. This was consistently highlighted in industry engagement sessions, but only if private and public-sector stakeholders constructively collaborate to realise its potential.

This SAAM report comprises five sections, three of which are contextual and two which represent its core value. In the first section, we review the state of the global automotive industry. We consider its recent development trajectory and analyse the comparative position of the automotive industry in several countries that we believe are benchmarks for the South African automotive industry. In the second section, we reflect on global automotive forecasts through to 2035, considering likely growth trajectories, as well as potential market, technology, and environmental shifts. The third section focuses on the comparative position of the South African automotive industry. The present position of the domestic industry is analysed alongside competing automotive economies, with key local industry strengths, weaknesses, opportunities, and threats summarised.

In the fourth section, we present a vision and associated set of objectives for the South African automotive industry through to 2035. In this section, we consider the SAAM vision to 2035, along with the six objectives that will determine the realisation of the Masterplan vision. The fifth and final section of the report is its most important, highlighting as it does the SAAM deployment framework that is intended to give life to the SAAM vision and associated objectives. This section is built around six working pillars and two foundations that are intended to frame the development of the South African automotive industry through to 2035.

1. Global automotive industry review

The global automotive industry generated sales of over $3.5 trillion in 2015[1], making it one of the global economy's most important economic sectors. Market and production aggregates within the global automotive industry have moreover largely recovered from the precipitous declines experienced over the period of the Global Financial Crisis (GFC) - 2008 to 2010. Global vehicle sales consequently reached 87.4 million units in 2015 (OICA), with KPMG (2015) estimating that global consumption will continue to grow to 95 million units in 2016 and 111 million units in 2020. Global production follows demand and as such similar production growth is anticipated for global OEMs, with approximately three quarters of all sales being generated within the passenger vehicle market and the balance from commercial vehicles. While light commercial vehicle sales have approximated passenger vehicle trends and are expected to continue growing in alignment with passenger market growth, medium and heavy commercial vehicle (M&HCV) market trends are substantially more negative. This has resulted in global annual M&HCV production stagnating at around 4 million units since 2007.

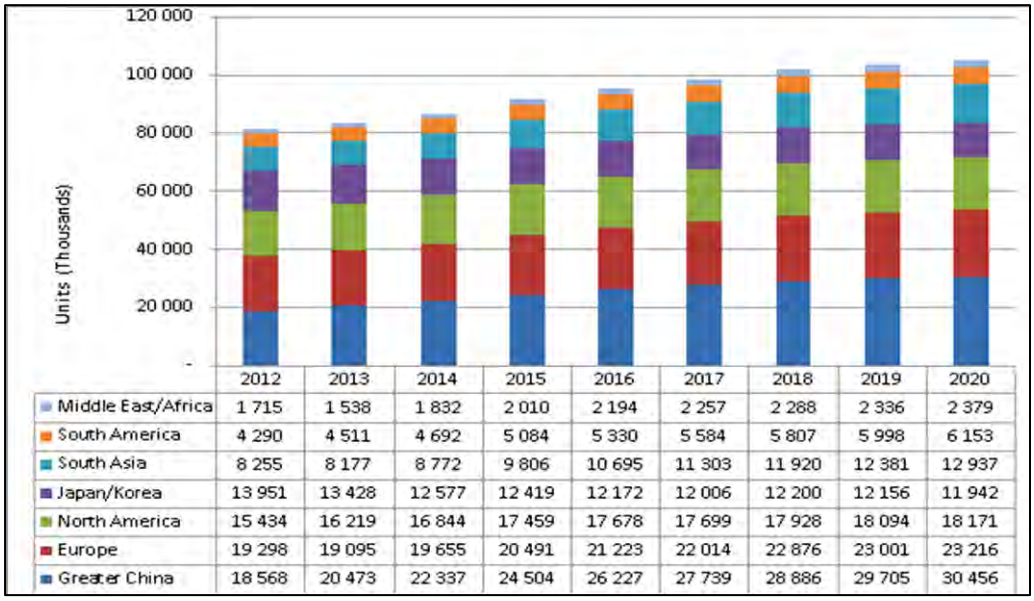
An analysis of vehicle unit sales growth at a global level is however severely limiting. A disaggregation of the global data shows, for example, that global vehicle consumption is increasingly bifurcated. Developed economy markets have experienced limited vehicle demand growth but continue to consume ever-more technologically advanced vehicles conforming to enhanced environmental, safety and connectivity standards; while emerging economies consume an ever-greater number of less technologically advanced vehicles at a substantially lower average unit value. For example, while the Asian market comprised 44% of global vehicle unit sales in 2015, the developed European and United States markets retained 56% global market share between them when analysed in value terms.

While developed economy markets continue to lead the development of the global automotive industry in terms of technology, safety and environmental standards, the future growth of the industry is likely to be strongly driven by emerging and middle-income markets. This is borne out by the fact that China alone was responsible for 47% of global vehicle consumption growth from 2010 to 2015, and that the existing profile of vehicle ownership densities in developing and developed economies points to strong emerging economy demand growth over the next 20 years. For example, the world's developed economies have vehicles ownership ratios ranging from 1.3 (United States) to 1.9 (Sweden) persons per vehicle, with an average of 1.6; while the figure for middle income economies ranges from 3.7 (Mexico) to 6.5 (Thailand and Turkey); and the figure for China and India only 17.1 and 58.9 respectively (JAMA, 2012; in Thailand Automotive Institute, 2012).

The short-term position of the global automotive industry is summarised in Figure 1 below. As highlighted, there are important regional dimensions to growth trends forecast through to 2020. Based on a more conservative B&M Analysts' forecast model that extrapolates 2012-2015 trends through to 2020, the industry is projected to breach 100 million vehicles of production in 2020, with 30% of this production to be in China (including Hong Kong and Macau), 22% in Europe and 17% in North America. Middle East/Africa is projected to only contribute 2.3%, with the slight shift from 2015 to 2020 projected to emanate from increased production in Morocco.

[1] McKenzie and Co., Automotive revolution – perspective towards 2030 (2016).

Figure 1: Global vehicle production forecast to 2020



	2012	2013	2014	2015	2016	2017	2018	2019	2020
Middle East/Africa	1 715	1 538	1 832	2 010	2 194	2 257	2 288	2 336	2 379
South America	4 290	4 511	4 692	5 084	5 330	5 584	5 807	5 998	6 153
South Asia	8 255	8 177	8 772	9 806	10 695	11 303	11 920	12 381	12 937
Japan/Korea	13 951	13 428	12 577	12 419	12 172	12 006	12 200	12 156	11 942
North America	15 434	16 219	16 844	17 459	17 678	17 699	17 928	18 094	18 171
Europe	19 298	19 095	19 655	20 491	21 223	22 014	22 876	23 001	23 216
Greater China	18 568	20 473	22 337	24 504	26 227	27 739	28 886	29 705	30 456

Source: OICA – Production Statistics (2012-2015); BMA forecast based on 2012-2015 trend

Notwithstanding the increased production forecast to 2020, global production overcapacity (relative to demand) is anticipated to continue unabated. Per KPMG 's projections, the global vehicle industry will sit with 26 million units of surplus capacity in 2019. This is due to a combination of market demand/production capacity misalignment and market-induced idle capacity at under-performing vehicle assemblers. This level of overcapacity reveals that the industry will continue to experience intense competitiveness conditions in the short term, with the financial returns secured by leading assemblers and the major component manufacturers likely to remain under pressure.

While the location of global vehicle production has gravitated to areas of increased vehicle consumption, and therefore from developed to developing economies more generally, a more detailed disaggregated analysis of global shifts indicates that certain automotive economies have benefitted to a far greater extent than others, and that national automotive policies have been an important determinant of which economies have gained from recent industry developments.

The national automotive economies that appear to have gained the most over the last few years are China, India, Mexico, Thailand, Turkey, Slovakia, and Morocco, while those that have experienced the most severe contractions include Australia and Brazil. This is the reason for the South African Automotive Masterplan process including detailed comparative policy research (see Barnes et al), as summarised in Table 1 below. What factors have driven successful automotive industry growth in the comparator set of economies? And what factors have impinged on, or negatively impact on automotive industry growth?

In general terms, domestic economic growth rates are the most important driver of both market demand and the expansion of production. But in respect of the comparator findings, it was noted that the most successful economies had implemented automotive policies that had increased their attractiveness to multinational automotive producers through a twin-focus on deepening market access opportunities (domestically, regionally, and internationally) and advancing their asset capabilities (advanced production and product capabilities). In combination, this had led to the most successful economies reviewed, growing their automotive industries significantly over the last few years. It was emphasised in the international research that while these economies were not

guaranteed future success, particularly given potential global market and production developments, they were best positioned to benefit from emerging trends.

Table 1: Comparative profile and performance of 12 selected automotive economies and South Africa

Economy	LV market (2015)	Major PTAs	Market depth rating*	PV CBU duty	LCV CBU duty	Market protection rating*	Incentive support rating*	Production (2015)	Production CAGR '11-15	Growth rating*
India	3,425,336	GCC, ASEAN	5	100%	35%	5	2	3,805,237	1.2%	1
Brazil	2,568,976	MERCOSUR	5	35%	35%	4	2	2,333,903	(8.1%)	1
Mexico	1,351,648	NAFTA	4	50%	50%	4	3	3,387,522	7.4%	4
Australia	1,155,408	Multiple	3	5%	5%	1	1	167,538	(6.3%)	1
Turkey	1,011,194	EU	3	10%	22%	2	4	1,307,038	3.4%	2
Thailand	797,579	ASEAN	3	80%	40%	4	4	1,888,130	7.1%	4
Malaysia	666,674	ASEAN	3	30%	30%	3	4	610,694	3.6%	2
RSA	587,214	EU, AGOA	3	25%	25%	3/1[2]	4	583,999	3.7%	2
Egypt	332,100	GAFTA, EU	2	40%	135%	5	3	12,000	(18.5%)	1
Morocco	131,910	EU, US, GAFTA	1	25%	25%	3	4	288,329	48.4%	5
Slovakia	90,091	EU	1	10%	22%	2	3	1,000,001	11.8%	4
Nigeria	26,400	AGOA	1	70%	35%	5	1	0	0%	1
Kenya	14,100	AGOA	1	25%	25%	3	1	0	(100%)	1

* Rating: 5=very high, 4=high, 3=average, 2=low, 1=very low.

Note: The market depth rating takes account of the size of the domestic market. The growth rating is based on historical production growth over the period 2011-2015 and is therefore not a forecast.

Key public-sector enablers of automotive industry growth noted in the comparator economy analysis, include the following critical support mechanisms:

1. Greenfield and brownfield plant investment incentives, with this support taking the form of grant support for investments made, or generous corporate income tax benefits based on the quantum of the investment made, or over a timeframe.
2. Incentives for asset-enabling activities, with this taking the form of incentives for training/skills development, industrialisation (testing), R&D, and industry-specific infrastructure.
3. Alignment of domestic market taxation and regulatory requirements with local production capabilities and specialisation (e.g. Turkey's requirement that OEMs invest in dealership networks before being able to sell even small CBU volumes in the domestic market; and Thailand's domestic market tax structure that effectively ensures a market bias for LCV derivatives and fuel efficient eco cars).
4. Coordinated upgrading support for the automotive industry (e.g. via the Thailand Automotive Institute in Thailand), often working in close collaboration with selected anchor investors.

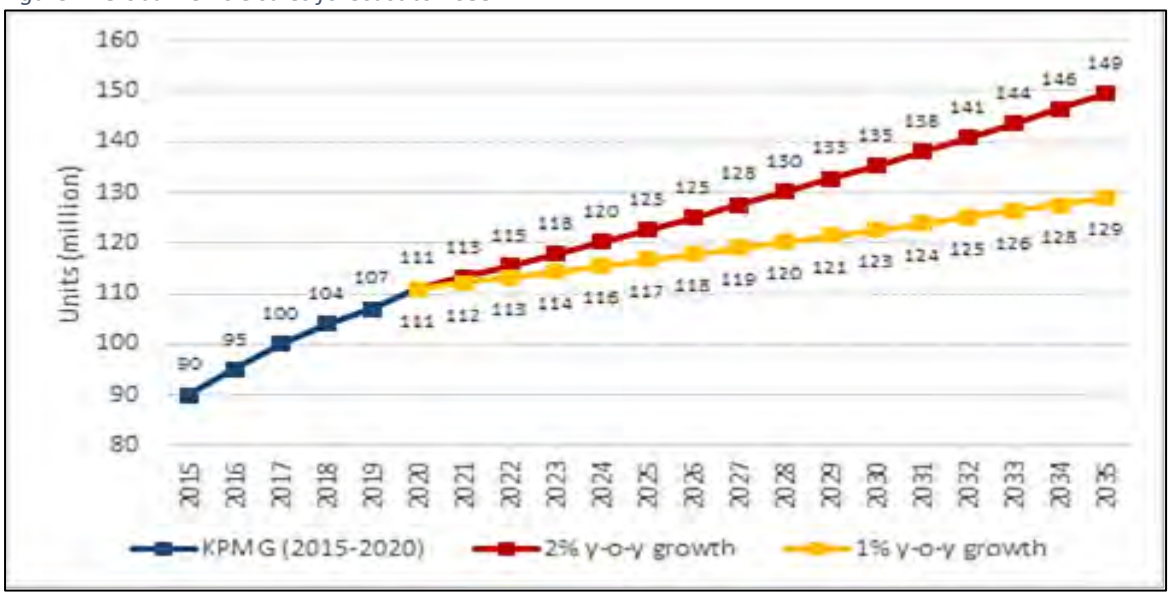
Interestingly, in the case of well-established developing economy automotive industries, such as in Thailand and Turkey, government support appears to be less focused on attracting investments from entirely new industry players, and more focused on deepening existing automotive activities, particularly in those areas that government (working in collaboration with industry) has identified as strategically important to supporting sustainable industry development.

[2] The South African score of 3 relates to the nominal rate of duty protection, while the score of 1 refers to market protection once duty rebates are factored into the rating.

2. Future global trends

Projecting global automotive trends post 2020 and through to 2035 is a difficult exercise. There are a range of major factors that are likely to strongly shape the future demand profile and associated development trajectory of the global automotive industry. How these factors intersect and influence one another is difficult to ascertain with any clear certainty. It is likely is that the demand for vehicles globally will moderate post 2020 with compounded annual growth rates from 2020 to 2035 projected to be in the order of 1% to 2%. If this is the case, then global automotive demand and associated production will range from 129 million to 149 million units in 2035. This projection is graphically presented in Figure 2 below.

Figure 2: Global vehicle sales forecast to 2035



Source: KPMG Global Automotive Executive Survey 2015; BMA forecast

The types of vehicles likely to be consumed in 2035 is difficult to gauge. The most striking automotive development globally is ever progressing environmental pressures. In part tied to the rising cost of fossil fuels, and in part tied to tightening developed economy emissions legislation, it is likely that the product strategies of the world's leading OEMs will continue to evolve quite dramatically at each major model changeover, which is typically every six to eight years. Each new model will need to exhibit improved fuel efficiency, although what specific technology changes this will manifest in over the next few years is still not certain. While vehicles will become lighter and more recyclable through to 2035, and that internal combustion engines (ICEs) will become smaller and far more fuel efficient per unit of power produced, the rate at which alternative engine technologies displace the ICE, and what specific material composites come to dominate "body in white" and structural components over the period is unclear. There are a range of energy efficient alternatives to the ICE, with electric engines and hydrogen fuel cells the two technologies presently competing for market share with ICEs, although presently mainly in hybrid form with ICEs. These Hybrid Electric Vehicles (HEVs) and Plug-in HEVs (P-HEVs) are presently taking small market share globally (2.0%), but they are expected to increase their share, before declining precipitously as they are replaced by full electric or hydrogen fuel cell vehicles. Bloomberg Energy Research projects that

EEVs will comprise 35% of the global market by 2040, with Electric Vehicles (EVs) dominating the basket of EEVs[3].

In addition to major structural changes in market demand through to 2035, several other important trends are also likely to strongly influence the profile of the global automotive value chain over the period:

- Changing consumer and end user customer preferences for light vehicles, M&HCVs, yellow metal products and motor cycles will lead to a global bifurcation of demand, with developing and developed economies following different demand trajectories. Essentially, the developed automotive world is moving rapidly towards a replacement-type industry with vehicle consumers demanding ever safer, technologically more advanced, and fuel-efficient vehicles, while developing economy vehicle consumption grows rapidly, but primarily for smaller, more basic vehicles.

- In response to the above, OEMs and their lead source suppliers will shift their production capacity closer to high-growth developing economy markets.

- Increasing concern for driver, passenger, and pedestrian safety in developed economy markets, manifesting in the rapid development of both passive and active safety systems.

- Growing demand for in-vehicle infotainment (and associated global connectivity) systems. At the extreme, this is visible in the significant investments being made by OEMs (and technology companies) on the development of self-driving/autonomous vehicles.

- The advent of self-driving vehicles together with other technological advances is likely to impact on attitudes to personal car ownership in developed economies. For instance, city dwellers may increasingly rely on low cost self-driving taxi services rather than private car ownership. This will in turn impact on the demand for vehicles.

- Commodification of certain vehicle production processes, notably assembly, and base metal forming/fabrication processes, with this being driven by the need to accommodate new technologies in vehicles while remaining price competitive. This will result in continued price pressures throughout the various tiers of the automotive supply chain into the future.

These trends will have major implications for the South African automotive industry, both opening and closing off industry opportunities. The growing market share of EEVs, rapidly growing vehicle demand and production in developing economies, tightening environmental regulations in developed and developing economy markets, advances in passive and active safety systems, infotainment technology shifts, including the potential development of autonomous driving vehicles, and ongoing cost pressures through the automotive value chain, are all critical global considerations likely to shape the evolution of the SAAM through to 2035.

[3] http://www.bloomberg.com/features/2016-ev-oil-crisis

3. South African automotive industry review

How does South Africa fit into this global automotive "jigsaw puzzle", and more importantly what are the key opportunities and challenges framing its position within the Global Value Chains (GVCs) that dominate the automotive industry? First, we need to position South Africa within the global industry. And as presented in Table 2, South Africa is a marginal light vehicle player globally, with 0.68% global production market share and 0.69% global consumption market share. If we rank South Africa as an automotive producer the economy holds second tier status, with the industry ranked 26th for passenger vehicle production, and 15th for light commercial vehicle production. The economies immediately ahead of us are Poland, Iran, and Slovakia; while those immediately behind us are Malaysia, Argentina, and Hungary. What is also clear is that at 615,658 units of total vehicle production in 2015, South Africa is a relatively unimportant producer relative to the world's Tier 1 automotive producers, which all manufacture more than 1.5 million vehicles annually.

Table 2: South African contribution and ranking in respect of global LV production, 2012 - 2015

Year	Passenger		LCVs		Total	
	Contribution	Ranking	Contribution	Ranking	Contribution	Ranking
2012	0.44%	27th	1.38%	16th	0.64%	24th
2013	0.41%	28th	1.41%	15th	0.63%	24th
2014	0.41%	28th	1.43%	15th	0.63%	24th
2015	0.50%	26th	1.31%	15th	0.68%	22nd

Source: OICA (2013-2016). Data excludes double counts.

South Africa's comparative position globally has remained largely unchanged over the last few years, with its comparative ranking and global contributions remaining relatively constant. The same applies in respect of M&HCVs. As depicted in Table 3, South Africa produced 0.9% of all heavy trucks globally in 2015, alongside 0.4% of all buses and coaches.

Table 3: South African contribution and ranking in respect of global M&HCV production, 2012 – 2015

Year	Heavy trucks		Buses and coaches	
	Contribution	Ranking	Contribution	Ranking
2012	0.74%	14th	0.35%	14th
2013	0.79%	13th	0.35%	13th
2014	0.83%	12th	0.46%	13th
2015	0.89%	13th	0.38%	13th

Source: OICA (2013-2016). Data excludes double counts.

While the South African automotive industry is reasonably small globally, it is a critical part of the domestic economy, with its contribution to GDP (including multipliers) estimated at 7.5%. This is inclusive of retail and aftermarket repair activities, although the manufacturing contribution represents most this amount. In aggregate terms the industry generated R235 billion in manufacturing sales in 2015, inclusive of R151.5 billion in exports (or 64.5% of the South African automotive manufacturing total) and employed 113,532 people across the assembly, components and tyre manufacturing sub-sectors. The industry's value addition is moreover concentrated in Gauteng, Eastern Cape, and KwaZulu-Natal, where the country's major OEMs are located, as depicted in Table 4.

Table 4: Automotive manufacturing in South Africa 2015

SA contribution	Gauteng	KwaZulu-Natal	Eastern Cape
Population (% of SA total – 55m)	13.2m (24.0%)	10.9m (19.8%)	6.9m (12.6%)
GDP contribution - % SA total (R3.8tn*)	34.4%	16.1%	7.6%
LV OEMs (vehicle assembly plants)	BMW, Nissan, Ford	Toyota	VW, Mercedes-Benz, GM,
Major M&HCV and yellow metal companies	Iveco, Scania, MAN (buses), Marco Polo	Bell Equipment, Hino, MAN (trucks)	FAW, GM /Isuzu, Mercedes-Benz
Auto component firms	200	80	150
Vehicle population: % SA total (11.7m units[4])	38.6%	13.5%	6.6%
PV sales: % 2015 total (412,670 units)	35.3%	12.9%	3.8%
LCV sales: % 2015 total (174,544 units)	31.2%	12.2%	4.7%
M&HCV sales: % 2015 total (30,535 units)	36.2%	16.3%	4.2%
LV production: % total 2015 (583,999 units)	30.9%	22.9%	45.9%
LV exports: % 2015 total (333,802 units)	33.3%	17.1%	48.8%

Source: AIEC (2016); StatsSA (2016)

* GDP at market prices for 2014

The recent performance of the South African automotive industry is mixed when analysed from 2012, the final year of the MIDP. A selection of Key Performance Indicators (KPIs) is presented in Table 5 and, as revealed, the strategic position of the South African automotive industry remains largely unchanged since the advent of the APDP. Positively, Table 5 reveals that light vehicle and more specifically passenger vehicle production has increased, that OEM purchases from local automotive component manufacturers has increased, that CBU exports have grown, that CBU imports have declined in unit terms, that component exports have increased, and that OEM employment has marginally increased. However, more negatively, the table also reveals that LCV production has declined marginally, that automotive component manufacturing employment has declined (per Statistics SA's Labour Force survey), although NAACAM data suggests growth, that local content in South African vehicles has declined to below 39%; that automotive component imports surged to R135 billion in 2015, and that South Africa's automotive trade deficit remains large and largely unchanged from 2012.

[4] This total is substantially larger than the 10.1 million vehicles reflected in the eNatis database (30 June 2016); as it includes motorcycles, other motorised vehicles, caravans, and trailers.

Table 5: South African automotive sector key indicators (2012-2015)

KPI	MIDP-end (2012)	APDP-start (2013)	APDP-latest (2015)	Change since 2012
LV production	517,162	513,645	583,999	66,837
PV production	272,076	265,249	341,025	68,949
LCV production	245,086	248,396	242,974	-2,112
M&HCV production	21,702	24,079	24,303	2,601
Local content per SA LV	46.6%	40.9%	38.7%	-7.9%
LV component purchases	R35.2bn	R 37.9bn	R 52.9bn	R 17.7bn
CBU exports – units	276,183	274,444	332,247	56,064
CBU exports – Rands	R 50.0bn	R 60.5bn	R 101.9bn	51.9
CBU imports – units	366,862	384,730	340,570	-26,292
CBU imports – Rands	R 50.1bn	R 63.6bn	R 61.6bn	-R 11.5
CBU imports: % SA PV market	73.2%	75.2%	73.0%	-0.2%
CBU imports as % LCV market	24.1%	24.4%	19.6%	-18.5%
Component exports – Rands	R 36.9bn	R 42.2bn	R 49.6bn	R 12.7
Component imports – Rands	R 86.0bn	R 102.9bn	R 135.1bn	R 49.1
Auto trade balance – Rands	(R 46.7bn)	(R 63.8bn)	(45.2bn)	R1.5bn
Manufacturing employment	100,566	104,772	113,532	12,966
OEM employment (NAAMSA)	30,566	30,132	31,432	866
Auto components (NAACAM)	70,000	74,640	82,100	12,100
Auto components (StatsSA)	58,057	53,563	45,735	-12,322

South African Automotive Masterplan research suggests that the South African automotive industry is beset with numerous competitiveness challenges. The South African automotive industry remains a marginal player globally, with comparatively small vehicle assembly plants, and an underdeveloped automotive components industry relative to leading developed and developing economy competitors. This is despite the automotive industry remaining critical to the South African economy, both in its totality, and in respect of the manufacturing portion of the automotive value chain. The South African automotive industry is at best a second-tier player within Global automotive value chains, although this perspective varies considerably from one major vehicle operation to the next. It would appear as if at least four of the seven light vehicle OEMs are firmly within the second tier of their parent company's global operations, with the balance third tier operations. The M&HCV sector comprises a set of SKD-type assembly operations, with pockets of significant value addition in bus assembly and the related yellow metals assembly industry. There is also no domestic motorcycle production, with the local market of 21,000 units so small that it is highly unlikely to support even the most basic local motorcycle assembly[5].

CBU production dynamics have placed substantial pressure on the automotive components industry, which has struggled to secure economies of scale because of volume limitations amongst domestic OEMs, a highly fragmented domestic parts and accessories market, and increasing international competition in both the domestic and international market segments serviced by South African based manufacturers.

A major deficiency in respect of South Africa's present automotive industry position relates directly to its poor recent domestic market performance, the extent of imports into the domestic market,

[5] Total motorcycle sales in South Africa were only 21,000 units in 2015. This represents 0.04% of global motorcycle sales. The domestic market is also highly fragmented, with luxury leisure motorcycles and mass-produced commuter motorcycles the two largest market categories.

and deteriorating regional market conditions. The optimism relating to Sub-Saharan African market growth, which was clear a few years ago, has abated, with the short-term prognosis for the regional market muted at best. Coupled with negative market conditions, the South African automotive industry is placed in a difficult strategic position, with recent vehicle production growth tied to exports into distant developed economies. These exports are supported by AGOA and the EU-SA FTA, as well as APDP benefits that compensate for the industry's substantial cost disadvantages. Local production is not being driven by local or regional market factors, which underpin the competitive advantage being secured by almost all the country's competitor economies.

While the automotive industry has certainly not gone backwards since the advent of the APDP in 2013, the evidence suggests a lack of dynamism in the operating environment. Aggregated vehicle production has increased, but production for the local and regional market has declined. While the value of local content has increased on the back of more vehicles being assembled in South Africa, local content levels have declined to below 40%; and there have been declines in aggregate industry employment. Growing local content and increasing employment are key government policy objectives and are at the very core of the underlying reasons for government support for the industry. The most positive finding is the substantial improvement in the automotive industry's CBU trade position since the advent of the APDP, with the country experiencing a small CBU trade surplus in 2015.

However, even here the key driver of this change appears to be declining domestic market demand and the exporting of South African assembled vehicles with declining local content levels, hence the overall automotive trade deficit (including components) remaining stubbornly high in 2015, at R45.2 billion. These factors do not suggest a fundamental change in either the South African automotive industry's base competitiveness or its strategic position. The national government may be providing substantial support to the South African automotive industry through the APDP, but the industry has not performed as well as a range of comparator economies, as presented in Table 1.

A comprehensive industry SWOT analysis completed amongst industry stakeholders as part of the SAAMP, reveals some of the critical underlying challenges presently facing the South African automotive industry. While the findings are potentially biased by the research methodology used, and the nature of the SWOT analysis completed, major existing industry weaknesses were noted, including logistics costs (especially rail and port costs), factor cost movements, and deficient employee skills. At the same time, the SWOT identified several major industry threats, including growing low-cost competition (in domestic, regional, and broader international markets), and deteriorating/increasingly expensive industrial infrastructure. It is critical, however, that identified weaknesses and threats should not be viewed as debilitating to the future success of the South African automotive industry.

Many existing strengths and future opportunities were also highlighted. For example, national government support is clearly recognised as a strength, along with the competitive advantage forged from having an established OEM presence in South Africa (with substantial sunk capital), demonstrated production capabilities across a range of vehicle and component product categories, competitive in-factory costs (labour, overheads), a functioning industrial infrastructure, and preferential international market access (via AGOA and the EU-SA FTA). Major industry opportunities identified ranged from domestic market stimulation, to SSA market growth, logistics cost improvements, increased localisation, skills development, electricity supply enhancement, and product specialisation.

The large number of opportunities identified reveals the extent of the potential for the long-term development of the South African automotive industry. Analysed in conjunction with a few positive industry developments under the APDP, and the significant contribution made by the automotive industry to the South African economy, the industry has the potential to support the growth and development of the domestic manufacturing sector specifically, and the South African economy more generally. How the industry potentially supports South Africa's economic development, and realises its full potential through to 2035, constitutes the critical challenge to which this document now turns.

4. Establishing a vision and associated objectives for the SA auto industry to 2035

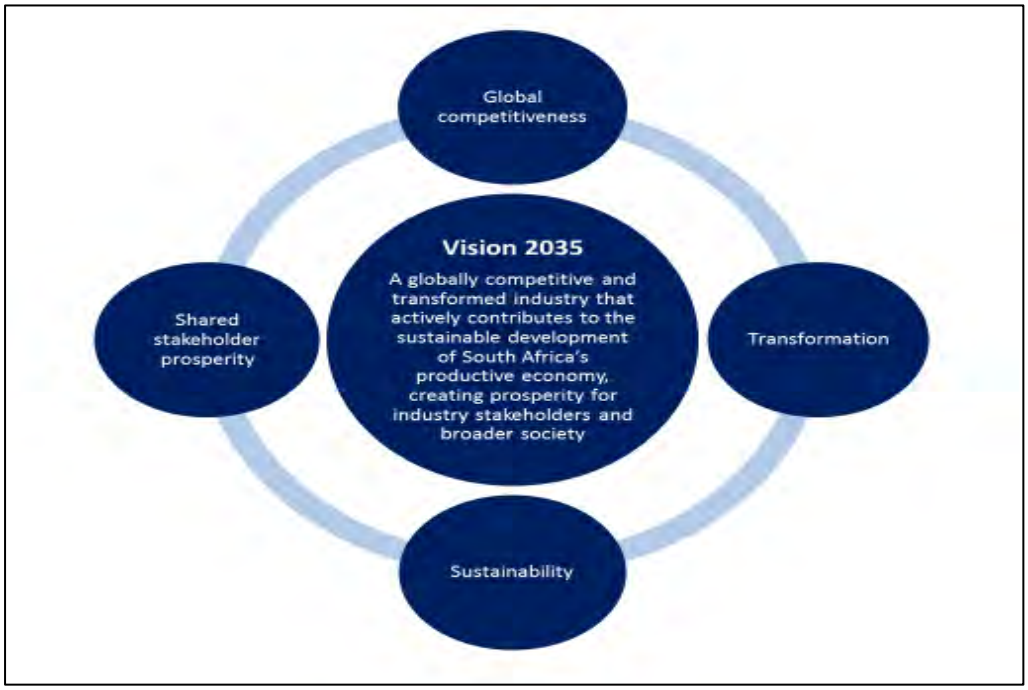
4.1. Industry vision

Nelson Mandela is famously quoted as arguing that "action without vision is only passing time, vision without action is merely day dreaming, but vision with action can change the world". It is in this light that the South African automotive masterplan requires a clear vision through to 2035. Based on industry engagements, the following working 2035 vision has been developed:

> *"A globally competitive and transformed industry that actively contributes to the sustainable development of South Africa's productive economy, creating prosperity for industry stakeholders and broader society."*

The vision articulated for 2035 essentially has four components. The first relates to its competitive position. And here the vision is clear. The South African automotive industry will be globally competitive (relative to leading international automotive producers) by 2035. The second component relates to the industry's contribution to the transformation of South African society. This encompasses multiple elements, from employment equity to the greater inclusion of Black-owned firms within the automotive value chain. The third component relates to the sustainable development of the South African economy. The critical elements encompassed within this component relate to the growth of the industry, employment provided, skills developed, and the improved environmental impact of products and production processes. The final component relates to the shared prosperity created by the industry, with the critical elements here comprising the financial health and wellbeing of firms within the value chain, fair employee remuneration, and the broader contribution of the value chain to the South African fiscus. The four components of global competitiveness, industry transformation, sustainable development, and societal contribution represent the aspirational heart of the vision, as depicted in Figure 3.

Figure 3: SAAM 2035 vision and key associated components



4.2. Key industry development objectives by 2035

The South African automotive industry's vision will only be realised through the achievement of a set of key development objectives. Six have been identified as being central to the realisation of the vision:

1. Grow South African vehicle production to 1% of global output
2. Increase local content in South African assembled vehicles to up to 60%[6]
3. Double total employment in the automotive value chain
4. Improve automotive industry competitiveness levels to that of leading international competitors
5. Transformation of the South African automotive industry through the employment of Black South Africans, upskilling of Black employees, empowerment of dealerships and authorised repair facilities, and substantially increasing the contribution of Black-owned automotive component manufacturers within the automotive supply chain
6. Deepen value addition within South African automotive value chains

While each of the six objectives is important it is only in achieving all six that the mutually reinforcing objectives will result in the realisation of the vision. Each of the objectives is unpacked in more detail below.

4.2.1. Grow South African vehicle production to 1% of global output

Growing South African vehicle production from 0.68% to 1% of global output would take domestic vehicle production to between 1.3 million and 1.5 million units by 2035, depending on the performance of the global automotive industry. Achieving this level of output would require each of the other four key industry objectives being realised: Local content would need to be substantially increased, employment (and associated skills) would need to be grown, industry competitiveness would need to be substantially advanced, and greater broad-based societal inclusion within the South African automotive value chain secured.

However, securing domestic growth to between 1.3 million and 1.5 million units of annual vehicle production would also require a number of other fundamental shifts in the present profile of the South African automotive industry, most notably capturing a substantially greater share of a growing domestic automotive market, significantly increasing sales into a regional Sub-Saharan African market that is presently undermined by low levels of disposable income and pre-owned vehicle imports, and maintaining preferential market access to established developed economies.

4.2.2. Increase local content in South African assembled vehicles to up to 60%

Average local content in South African assembled vehicles is presently below 40%, ranging from around 30% for high technology, high value passenger vehicles, to 45% for light commercial vehicles and smaller passenger vehicles. The average of 38% is despite almost a century of domestic vehicle production. The comparative local content level in competitor economies such as Thailand and Turkey is substantially higher than evident in South Africa, although even in these more successful second tier automotive economies securing very high levels of local content is a challenge, particularly when core powertrain and drivetrain technology is typically supplied from source (or first tier) automotive economies. A realistic objective should therefore be the attainment of 60% true local content in South African assembled vehicles by 2035, with a lower objective of 50% for

[6] This aspirational target is recognised as being attainable for LCV and small passenger vehicle production, but a major stretch for high value, high technology, luxury vehicle assembly in South Africa. While the SAAM primarily refers to a 60% target for the South African automotive industry, high technology vehicles are likely to achieve a lower 50%.

high technology, high value passenger vehicle assembly. This would represent over 50% growth on existing local content levels and, it would ensure that the industry's exposure to substantial logistical costs is reduced (at least in terms of component and materials imports). It would therefore mutually reinforce the balance of the objectives in support of the industry's vision. Increased local content should improve the competitiveness of the industry provided the increased local content is sourced at competitive global prices. Local suppliers need to achieve economies of scale to be competitive. Increasing local content would therefore require continued progress in local production of high-volume models and rising average model volumes.

A key dimension of this challenge is the growth and development of domestic automotive component manufacturing throughout the tiers of the value chain. Increased local content in South African assembled vehicles should result in the deepening of production capabilities that can then be used for supplying the domestic and regional aftermarkets (where appropriate) and for supplying global CBU platforms. This would represent an important milestone in the development of the South African automotive components industry: developing capabilities for local OEM supply that are sufficiently competitive to support broader global market supply.

4.2.3. Double employment in the automotive value chain

Employment growth is not an independent variable within the automotive value chain. It is entirely dependent on the growth of value addition, which is itself dependent on increasing production aggregates and local content within these aggregates. Improving employee skills and raising labour productivity and capability should however positively influence emerging industry business models to take advantage of South African labour opportunities over deeper levels of capital intensification. This should drive increased employment within the industry.

Based on the South African automotive industry growing its annual production to 1.4 million vehicles at an aspirational 60% local content by 2035, combined with improving productivity, the industry should be able to substantially increase its employment contribution to the South African economy. This is depicted in Table 6, which projects forward South African automotive industry growth in 2035 to 1.39 million units[7]. Based on the average value of South African assembled vehicles in 2015, and holding this constant through to 2035, alongside 60% local content levels, and a productivity improvement factor of 61%, total industry employment increases to 224,000 in 2035.

Importantly, the employment growth projected in Table 6 includes component manufacturer employment associated with domestic aftermarket and export supply. These two important market segments are responsible for roughly one-third of South African automotive component manufacturing activity, with the model projecting equivalent growth in these market segments to that experienced in respect of domestic CBU supply.

Table 6: South Africa automotive performance potential to 2035 (in constant Rand values)

Production	2015 (base)	2020	2025	2030	2035
Light vehicles (4.5% CAGR for PVs, 3.5% for LCVs)	583,999	735,669	900,044	1,101,746	1,349,373
M&HCVs (3.0% CAGR)	24,303	27,353	31,710	36,760	42,615
Total vehicle production	608,302	763,022	931,754	1,138,506	1,391,988
Avg. value of SA produced vehicles (constant)	225,804	225,804	225,804	225,804	225,804
Value of production (Rm)	137,357	172,293	210,394	257,079	314,317
Local content (%) (2.2% annual improvement)	38.70	43.18	48.19	53.77	60.00
Local content value (Rm)	53,157	74,403	101,382	138,231	188,589
Employment (productivity adjusted – 61%)	112,000	129,570	151,882	182,355	224,000

[7] This is based on the mid-point between the global automotive industry's growth forecasts to 2035 of 129 million and 149 million units respectively.

4.2.4. *Improve automotive industry competitive levels to that of leading international competitors*

The South African automotive industry's ability to achieve substantial growth through to 2035 is predicated on its capacity to attain competitiveness levels comparable to that of its leading international competitors. This straddles numerous dimensions, ranging from the obvious of cost, to quality, delivery reliability and operational flexibility, to the less obvious of process and product innovation and the development of skills capable of absorbing new industry technologies that are likely to increasingly dominate vehicle and automotive components production through to 2035. However, the industry urgently needs to resolve a base conundrum to ensure that it is able to break its present growth inertia: Growth will significantly improve industry competitiveness through improved scale economies, the realisation of external economic benefits, and the productivity and broader competitiveness benefits associated with increased product and production specialisation; but growth will only be secured if productivity and cost competitiveness first improves to justify increased industry investment. This conundrum will only be resolved if the industry's base competitiveness is first improved – so improving quality and reliability standards, alongside non-scale-related costs and productivity levels that remain some distance from leading international competitor standards.

4.2.5. *Transformation of the South African automotive value chain*

The South African automotive industry has become increasingly multinational dominated over the last two decades. There is consequently no space for South African capital at an OEM level, and only limited space for South African capital at a Tier 1 automotive component manufacturing level. At these levels, the industry's ability to contribute to the transformation of the domestic economy lies in its fiscal contributions, employment of Black South Africans, enterprise development, and the deepening of skills and technology spill overs. The industry's contribution in respect of the South African fiscus and employment are well recognised and will continue in alignment with its growth and scale of operation. However, it is in respect of the last two critical elements that the industry has a potentially significantly greater role to play in supporting South Africa's broader industrialisation, while simultaneously benefiting from dynamic capabilities developed within the domestic economy.

Focusing first on enterprise development, it is critical that the South African automotive industry improve its inclusiveness by supporting the development of 2nd and 3rd tier Black-owned automotive component and associated materials manufacturers. At present, there are only a small number of Black-owned suppliers operating as 2nd and 3rd tier suppliers, with major scope for increasing both the number of firms, and the value of their output to the industry. There is presently no formal valuation of the contribution of Black-owned suppliers to automotive GVA and as such no base on which to assess future growth. This is however an urgent requirement, with NAACAM identifying only 14 Black-majority owned automotive component manufacturers, many of which are only small firms. A reasonable target for the South African automotive value chain, which is projected to increase its output three-fold through to 2035, is to increase the contribution of Black-owned suppliers' automotive GVA within the economy to 25% of the Tier 2 and Tier 3 total.

An adjacent major enterprise development opportunity exists in relation to the transformation of the vehicle assemblers' (including importers) dealership networks and authorised repair facilities. This portion of the value chain is typically under the control and direction of South African subsidiary operations, and as such it represents an opportunity for multinational vehicle assemblers to support the development of a more sustainable equity profile within the South African economy – without negatively impacting on critical, value adding multinational production investments in the country.

Second, the automotive industry's vital technology spill over effects will be amplified in a South African context if sensitivity is shown to the employment and promotion of Black South Africans through internal employment equity processes. There are very few industries globally that match the high value skills development opportunities embedded within the automotive industry, both at OEM and component manufacturing levels. The biggest contribution the South African automotive industry can play in respect of positive societal transformation is therefore the development of Black technical, professional, and management skills at an OEM and Tier 1 level through to 2035, with this benefit to be amplified by the projected growth in employment.

4.2.6. Deepen value addition within South African automotive value chains

The final objective identified through the SAAM process is the need for the South African automotive industry to increase its value addition within the automotive value chain, outside of the local content in vehicles. This relates to South Africa's participation in processes of Research and Development, which have become increasingly marginalised since the mid-1990s. While South Africa has benefitted significantly from the integration of the industry into automotive GVCs since the advent of the MIDP in 1995, one of the negative developments has been the erosion of domestic involvement in Research and Development activities, whether as part of global projects, or in respect of processes of local product industrialisation. It is essential that the South African automotive industry develop fully functional, independent testing and associated verification capabilities over the next few years, while simultaneously identifying and nurturing more advanced R&D capabilities in selected automotive engineering fields.

The movement towards EEVs, more fuel efficient ICEs, and the associated increased use of composites, advanced light-weight materials, and nanotechnology, alongside advancing passive and active safety features on vehicles, and rapidly evolving infotainment technologies, point to a future where the South African automotive industry either plays a narrow assembly/light manufacturing role within automotive GVCs, or establishes itself as a part of an emerging product development ecosystem, and demonstrates its ability to increase its value addition within particular product niches. Identifying and deepening South African involvement in these niches is clearly a critical development challenge for the South African automotive industry. While it is almost impossible to identify an explicit target in respect of this objective, it is recommended that at least three major product capabilities that align with South African base capabilities be identified as industry priorities through to 2035 and focused on by national government agencies and the industry to ensure South African involvement in broader value chain activities within automotive GVCs.

4.2.7. Summary of key objectives

The six key objectives for the South African automotive industry are summarised in Table 7. It is important to present the objectives in a summarised form as they need to be viewed as a mutually supportive package of objectives, as opposed to being individually exclusive. Whether the objectives are realised or not is entirely dependent on substantial progress being made across each of the six key areas identified. "Cherry picking" selected objectives over others will undermine the realisation of the industry's vision to 2035[8].

[8] Selecting certain objectives over others is likely to represent one of the major implementation challenges of the SAAM. The objectives are meant to be reinforcing, with each delicately linked to the realisation of others. Failure to recognise this could result in implementation failure, hence the importance of the institutional processes to be established in support of the SAAM.

Table 7: Summary of SAAM objectives and estimated impact on South African automotive industry[9]

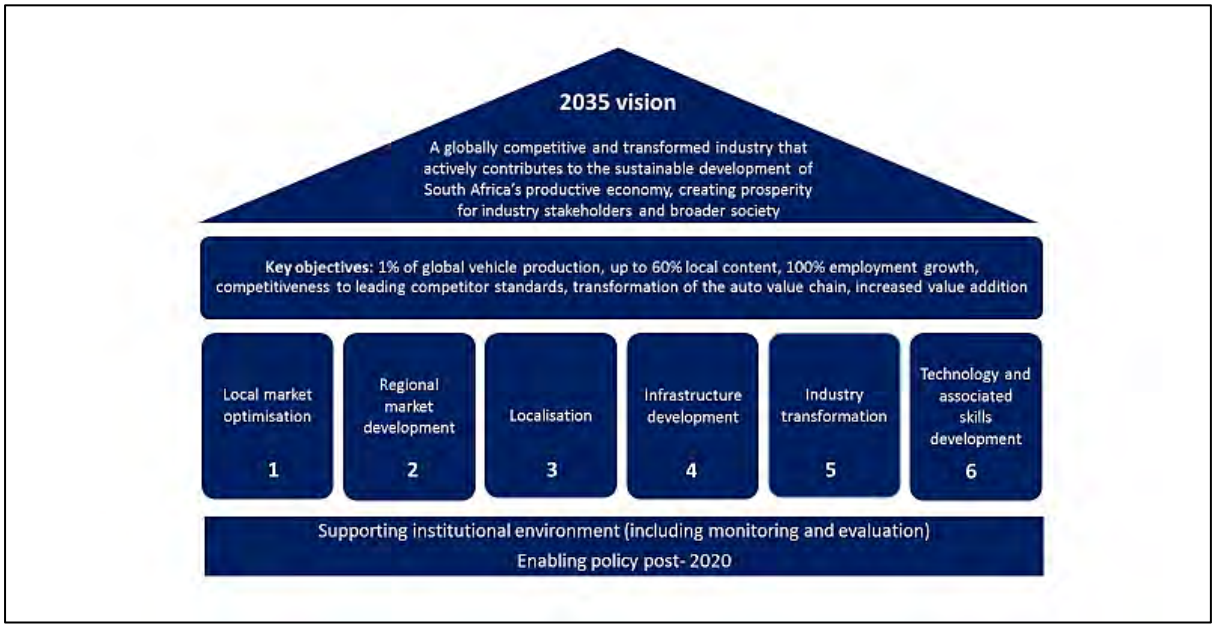
Objective	Estimated impact on SA auto industry
1. Grow SA vehicle production to 1% of global output	• CBU production to 1.39 million units annually (129% higher than 2015 levels) • Increase of value of vehicle production to R314 billion
2. Increase local content in SA assembled vehicles to up to 60%	• Increase of R135.4 billion on 2015 local content levels • Local content increase of 21.3% per vehicle produced (55% increase) • Increase automotive component aftermarket and export production by at the same pace as local content growth
3. Double employment in the auto value chain	• Employment growth of 112,000 • Aggregate employment from 112,000 to 124,000
4. Improve auto industry competitive levels to that of leading international competitors	• Sustainable automotive industry based on comparative price and non-price competitiveness versus leading international competitiveness • Sustained export competitiveness
5. Transformation of the South African automotive value chain	• 25% Black-owned involvement at Tier 2 and Tier 3 component manufacturer levels, as well as in dealership networks and authorised repair facilities • Amplified skills development of Black South Africans • Enhanced employment equity at senior management, artisan and professional employment levels across automotive value chain
6. Deepen value addition within SA auto value chains	• Growth in R&D and other innovation metrics within the South African automotive value chain

[9] The economics presented in this table are explained in Appendix A.

5. Masterplan pillars

Giving life to the masterplan and the realisation of the package of associated objectives articulated in Table 7 requires an institutional approach that supports the development of the industry in alignment with the industry vision and objectives set. Based on the extensive local and international research completed for the SAAM, six fundamental masterplan pillars have been identified as key focus areas to be actioned through to 2035. As outlined in Figure 4 below, these six pillars are envisioned to actively support the realisation of the industry's 2035 vision, with one critical caveat – that a foundational and supportive policy environment is established post the conclusion of the APDP in 2020.

Figure 4: SAAM's 2035 vision, objectives, and strategic implementation pillars



Each of the pillars, as well as the supporting foundations of the SAAM, is explained below.

5.1. Local market optimisation

The South African automotive industry will not realise its critical objective of achieving 1.4 million units of vehicle production in 2035 unless two fundamental changes occur in respect of the domestic market. The first fundamental market change relates to its future growth. At only 617,749 units of consumption in 2015, and a projected decline to 555,500 units in 2016, the domestic market will sell 158,815 vehicles less in 2016 than it did in 2006 (when sales peaked at 714,315 units). While NAAMSA projects a small market recovery in 2017 (to 567,000 units), the domestic market will need to grow at a compounded average growth rate (CAGR) of at least 4.5% for passenger vehicles, 3.5% for LCVs and 3% for M&HCVs from 2017 to 2035 to support vehicle production of 1.4 million units. These growth rates will take the total domestic market to 1,179,815 vehicles by 2035, ensuring South Africa remains a second-tier market[10]. However, the growth of the domestic market is strongly tied to the state of the South African economy, with a strong and direct correlation between economic growth rates and vehicle consumption evident. Mechanisms to artificially stimulate

[10] For example, if the South African market was this size at present, the country would rank as the 15th largest automotive market globally (in terms of vehicle units sold) – thereby significantly raising its profile within the automotive GVC.

vehicle consumption in domestic markets have generally failed in other developing economies, other than significantly reducing taxes on vehicles. This is clearly not a sustainable option for South Africa, while short term interventions to bolster demand in other economies has typically simply pulled forward purchases to benefit from incentives in place, resulting in subsequent steep market declines (as observed for Thailand).

The second fundamental change required in the domestic market is consequently the potential for local manufacturers to capture a substantially greater portion of the South African vehicle market than is presently the case. Existing levels of import penetration into the domestic LCV market appear sustainable at 19.6%, but the existing PV import market share of 72.7% is likely to undermine future industry development opportunities. The challenges facing South Africa in this regard are crystallised when analysing the spectrum of products manufactured locally for the domestic market. Nearly 50% of the domestic market comprised small passenger cars in 2015 and yet only two locally manufactured platforms (the Polo/Polo Vivo and Chevrolet Spark) competed in this market segment, with the balance of products comprising imports. The same concern exists in relation to the small crossover/mini-SUV segment that has grown rapidly in South Africa, displacing a large segment of the B and C category passenger vehicle markets. No South African OEMs produce vehicles in this market category, despite its recent strong growth, thereby ensuring a clear misalignment between South African market developments and local production trajectories. The one exception to this relates to LCVs, where local production dominates the domestic market (with 80.4% market share), but the LCV market is small in relation to the passenger vehicle market (174,544 units versus 412,670 units in 2015), suggesting a more substantial opportunity in the domestic passenger market segment.

South Africa has a huge amount to learn from the Thailand automotive experience in respect of aligning domestic production and market demand (initially LCV preference, followed by its eco-cars programme), as well as Turkey in relation to setting stringent homologation and service infrastructure requirements that ensures a more limited range of major OEMs compete in the domestic market, thereby ensuring competition and the ability of firms to realise scale economies in the domestic market. The changes required to stimulate and/or shape the domestic market to better align local production with local consumption are largely policy related and are therefore not covered here, although it is important to recognise the importance of domestic market optimisation hence its inclusion as the first pillar of the SAAM.

The demise of the Australian industry is a clear lesson in the implications of losing a domestic market to imports and then forcing an export focus on local OEMs to compensate for lost volumes. South Africa should not follow this route, particularly when the domestic market still has so much potential. At 6.3 people per vehicle in operation, South Africa is far from having a mature market (typically reached between 2.0 and 1.3 people per vehicle in operation).

5.2. Regional market development

A critical ancillary to the growth and development of the South African automotive market is the development of a regional market dynamic. There is presently no Sub-Saharan African (SSA) economy with a new vehicle market exceeding 30,000 units of annual demand. This is partly due to the small size and weak state of most SSA economies (as well as the lack of access to credit), but the most significant reason is the importation of pre-owned vehicles at sub-economic values from Japan (primarily into East Africa) and North America (primarily into West Africa). These pre-owned vehicles decimate the new vehicle market within SSA markets, limiting new vehicle demand to luxury vehicles for the wealthy and LCVs for mixed use (commercial/commuting) purposes. The potentially

large entry level new passenger vehicle market is displaced by larger, significantly more affordable pre-owned vehicles. While these markets remain attractive to South African component manufacturer supplying into the aftermarket the CBU-aligned supply chain in South Africa and regionally is not supported, thereby stunting regional market opportunities for the South African, and neighbouring country automotive industries; and thereby limiting the potential for the creation of a viable automotive space within SSA.

Demographic data reveals that there will be major middle-class growth across SSA over the next 15 years. According to Ward (2011; in Thailand Automotive Institute, 2012), the middle-class population of SSA will grow from 137 million in 2009 to 341 million in 2030 – growth of 149%. This reveals that the SSA market holds major potential demand for new vehicles across the spectrum of passenger vehicles, LCVs, M&HCVs, off-highway vehicles, and motor cycles. Developing a regional market and associated production dynamic is a critical strategic imperative. In respect of light vehicles only: if the South African domestic market were to achieve 1.2 million units of demand by 2035, alongside an SSA new vehicle market of a further 800,000 units, then an attractive regional market dynamic would clearly be in place, allowing for the establishment of a common market of around two million units. This would begin to approximate the positive momentum built in ASEAN and MERCOSUR, positioning SSA as an attractive market and investment opportunity. However, how does the South African automotive industry play a role in establishing such a regional market dynamic to the benefit of itself and other participating SSA economies? Key is establishing a business case for the establishment of a regional automotive trade and production block that positions SSA as a viable automotive space.

As the leading automotive producer in SSA it is essential that South Africa leads this process, but at the same time ensures that participating countries receive mutual benefit from its establishment. The critical opportunities in this regard relate to passenger vehicles, LCVs, M&HCVs, off highway transport equipment, and motor cycles, with the potential to create a regional production platform enhanced by the breadth of the range of product covered in this masterplan. Establishing a regional automotive development programme that operates to support the shared industrial development aspirations of SSA economies is therefore critical. Practically, this may require a phased approach over the period through to 2035, starting with a common SACU-automotive development plan, through to a SADC plan, followed by an SSA-wide plan. The timing and associated execution of these plans requires the establishment of a clear private-public partnership, and inter-governmental working relationship that ensures the realisation of potentially significant mutual benefits.

5.3. Localisation

Sustainably growing vehicle production is simply one facet of the development challenge facing the South African automotive industry. An equally important, and associated, challenge is the deepening of local content through the South African (and regional) automotive value chain. At only 38.7% local content in South African assembled vehicles in 2015, the ability of the South African automotive industry to realise its growth potential is likely to be severely compromised. As a second-tier automotive producer, the domestic automotive industry has the potential to grow its local content to up to 60%. This is based on the recognition that core drivetrain, powertrain, safety, and infotainment technology will not be sourced from South Africa through to 2035, but that there is substantial opportunity to increase local content in South African vehicles – as evidenced through the experiences of other second tier automotive economies, such as Turkey, Thailand, and Brazil.

Developing localisation is a multi-dimensional challenge requiring a multi-faceted response. At the most basic level it is associated with improving South Africa's factor cost profile (overheads, labour,

and materials costs) and productivity, along with the economy's ability to ensure technology and skills availability ahead of industry demand. However, improvement across these factors simply represent a necessary, but insufficient condition for the deepening of local content within the South African automotive industry. Research completed for the Masterplan has emphasised the debilitating impact of exorbitant logistical costs and government-administered service price increases (electricity, water, waste removal, rates, etc.) on the operating costs of firms. This has resulted in major operational challenges for firms, thus limiting localisation opportunities. As firms have shifted their business models to accommodate these increasing costs, critical local content has been lost, along with associated technologies and skills. Reversing this trend requires the stabilisation of government-administered service costs, and the development of technology and associated skills required by firms looking to deepen their own value addition, or to source components/materials locally, as opposed to readily available foreign sources. This base capability building should improve the general position of the South African automotive value chain and create the preconditions that are likely to encourage the deepening of local content.

Additional key elements relate to the creation of targeted specialisation within the automotive value chain, and the potential to strategically link South Africa's materials base with emerging automotive opportunities. Dealing with specialisation first; unless firms can secure economies of scale within the domestic automotive industry, they are unlikely to be sufficiently competitive to deepen their value addition. Key then is identifying opportunities to secure improved economies of scale. This is partly a policy issue, and therefore not covered here, and partly a strategic imperative requiring industry coordination and programmatic interventions. The South African automotive industry, working in partnership with national government, has established the Automotive Supply Chain Competitiveness Initiative (ASCCI) as the vehicle for identifying and responding to localisation opportunities, and it is critical that the industry and government collaborate on specific agreed-upon opportunities, especially where local materials availability provides the scope for substantially improving local content through South African automotive supply chains, and establishing potential areas of specialisation for the domestic industry within GVCs.

5.4. Automotive infrastructure development

Linked to the challenge of localisation is the need for the South African automotive industry to operate within a world class, secure, environment comprising advanced logistical linkages and associated transport infrastructure (land, air, sea); efficient industrial parks (factory infrastructure, along with required energy, water, and other amenities); and ready access to semi-skilled labour, as well as more advanced administration, artisan, and professionally skilled staff. Developing this infrastructure in alignment with evolving automotive industry requirements is critical to the realisation of the industry's potential. South Africa's global competitors have invested heavily in automotive-specific infrastructure, including state of the art industrial estates, supplier parks designed for Just in Sequence OEM supply, excellent global connectivity in respect of transport and telecommunications infrastructure, and the establishment of advanced product testing and automotive homologation centres. To compete globally, it is essential that the South African automotive industry have access to domestic infrastructure (and associated services) of a similar standard to that of the country's leading international competitors.

Automotive infrastructure is, however, far more than simply the development of advanced productive assets. It also incorporates market-related and emerging technology elements. In respect of market-related infrastructure, it is essential that the South African market secure the availability of advanced fuel (petrol and diesel) qualities to ensure future alignment between domestic market

product demand and international market demand. There is a real danger that the country's low fuel quality standards increasingly compromise South Africa's production base, with products for the domestic market needing powertrain and drivetrain adjustments relative to products being supplied to developed economy markets. This creates potential diseconomies of scale and an unnecessary layer of production complexity that competing production locations do not need to deal with. Resolving South Africa's fuel quality issues is complicated, but substantial progress needs to be made, particularly when reflecting on the emission and fuel consumption changes that are set to occur in the world's leading markets, as unpacked in Figure 5 and Figure 6.

Figure 5: Passenger CO2 emissions and fuel consumption actuals and targets, 2000-2025

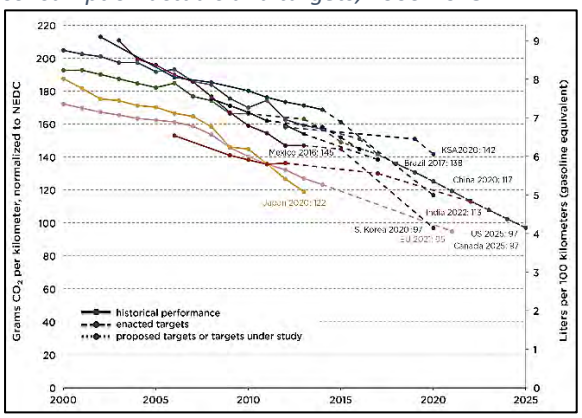
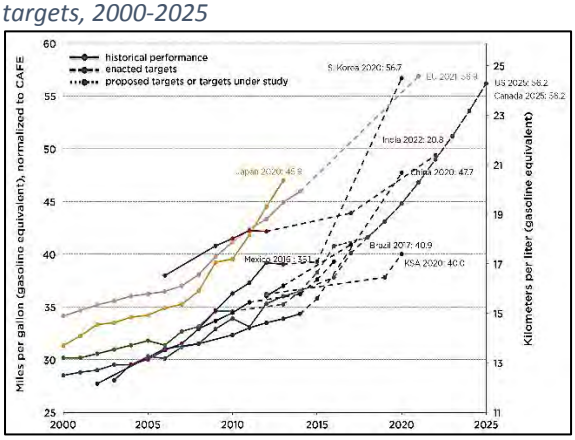


Figure 6: Passenger car miles per gallon actuals and targets, 2000-2025



*Note that Japan has already exceeded its 2020 statutory target as of 2013
Source: The International Council of Clean Transportation, 2015 (http://www.theicct.org/global-pv-standards-chart-library)

In terms of emerging technology changes, it is also critical that South Africa invest in alternative technology infrastructure to enable the transition to Energy Efficient Vehicle (EEV) use. This will initially follow a hybrid-Internal Combustion Engine (ICE) route, such as the use of Plug-in Hybrid Electric Vehicles (PHEVs), followed by battery-electric and hydrogen vehicles. South Africa is likely to lag the development of EEV markets across major developed economies, but the economy will absorb many EEVs by 2035, and it is incumbent on the industry and government to invest in the required infrastructure to ensure South Africa does not become a laggard in the next evolutionary phase of the global automotive industry.

5.5. Industry transformation

Supporting the positive transformation of South African society is a fundamental SAAM objective, and as such one of its key pillars. In alignment with the principles of Broad Based Black Economic Empowerment (BBBEE), industry transformation has numerous focus areas. First, tied to the anticipated major growth in the automotive industry through to 2035, it is projected that the employee cohort brought into the industry will broadly represent the demographic profile of South African society (in terms of race, gender, and physical abilities), with this evident across the full spectrum of automotive industry employment categories, including artisans, professionals, management, and executives. Second, given the automotive industry's advancing skills requirements, employee education and skills development will remain a priority, thereby ensuring that technical and advanced management skills are transferred into the South African economy.

Third, the manufacturing portion of the South African automotive value chain will prioritise lower tier majority Black-owned supplier development. In alignment with the SAAM objective of increasing

the proportional involvement of majority Black-owned Tier 2 and Tier 3 automotive component manufacturers within the South African automotive industry to 25% by 2035, substantial enterprise development support will need to be provided to firms that meet the stringent operating requirements of the automotive industry. It is critical that this objective is also closely monitored through to 2035, with remedial actions to be enacted to ensure a smooth progression towards the realisation of the objective, as opposed to simply a statement of intent. It is therefore recommended that ASCCI's activities are clearly aligned with this objective, and that progress across each of the three transformation focus areas outlined in this SAAM are monitored annually through a new SAAM-institution (as explained below).

Finally, South African OEMs (including importers) have the potential to support the transformation of the country's dealership network and authorised vehicle repair facilities through to 2035. While this portion of the value chain has not been included in the scope of the SAAM, the transformation of dealerships and authorised vehicle repair facilities would appear to represent ideal opportunities for OEMs to secure equity-equivalent scores on their BBBEE scorecards, hence the inclusion of this focus area.

5.6. Technology and associated skills development

It is critical that the South African automotive industry develop a technology and associated skills development roadmap to support the evolution of the industry in alignment with each of the key SAAM elements identified. For example, South Africa requires an EEV technology roadmap focusing on likely changes to the domestic, regional, and international markets supplied by the local industry, and the associated technology developments that will shape its future growth. Securing up to 60% local content in South African assembled vehicles must constitute a core focus of the SAAM. Preparing for, and responding to likely emerging technology developments, is therefore a clear SAAM priority. The scope of the technology roadmap will moreover transcend EEV powertrain and drivetrain developments, with active and passive safety technologies, material composites, infotainment technologies, the increasing use of nanotechnology, additive manufacturing, and product recycling all likely to feature as critical technology developments over the period to 2035.

As product development and production processes within the automotive industry become more environmentally sustainable, there will also be clear requirements for the deployment of new production technologies in South Africa. These may require new types of industrial infrastructure that need to be understood and responded to, to ensure South Africa does not fall too far behind the automotive technology frontier, and that domestic production continues to qualify for supply into developed economy markets with ever-more demanding environmental requirements that are likely to represent new forms of Non-Trade Barriers in future.

To realise its full potential, South Africa also has a discreet set of automotive-linked materials supply that will need to be developed in alignment with the evolution of new automotive technologies. These materials, including Platinum Group Metals, aluminium, and certain grades of steel, represent core areas of potential sustained competitive advantage for the South African automotive industry. It is therefore essential that base South African capabilities are advanced across these core materials in support of automotive industry requirements through to 2035.

Finally, it is critical that the technology roadmap developed for the South African automotive industry to 2035 includes an associated skills development plan. The global automotive industry's skills requirements are advancing in tandem with technology advances. This requires a fundamental shift in both the number and the level of skilled personnel being recruited into the South African

automotive industry. South Africa's global automotive competitors are developing skills in advance of industry requirements to ensure that skills bottlenecks do not stunt the growth and development of their industries, and it is critical that the South African automotive industry, working in partnership with government and other social partners, follow a similar model.

5.7. Institutionalising the SAAM

Defining a clear vision for the South African automotive industry to 2035, along with a transparent set of associated industry objectives, is an important first step in defining the type of industry that stakeholders would like to see it evolving into and can agree on supporting. Based on intensive industry engagements as part of the SAAM development process, this appears a relatively straightforward step, with a clear and largely consistent set of views expressed across the spectrum of South African automotive industry stakeholders. In support of the vision set, industry stakeholders would like to see the South African automotive industry develop to 1% of the global automotive industry by 2035, with up to 60% local content in South African assembled vehicles, a doubling of employment, and a substantial increase in majority Black-owned firm involvement in the industry value chain. It is recognised that this will need to be underpinned by substantial improvements in the competitiveness of the South African automotive industry (to leading competitor levels), and a deepening of industry value addition in selected areas.

The second critical step is securing industry agreement on the key areas that need to be focused on to ensure the agreed-upon vision and objectives are realised, and in this regard, we have identified six mutually supportive pillars, with these summarised in Table 8. As further highlighted in the table, each of the pillars will require the support of different industry agencies, along with additional substantial scoping work, to ensure a clear implementation plan through to 2035.

Table 8: Summary of SAAM pillars, key support agencies, and critical activities

Pillar	Key support agencies	Critical outstanding activities
1. Local market optimisation	DTI, National Treasury, DED	Post-2020 policy
2. Regional market development	DTI, SACU, SADC, Trade and Industry departments of neighbouring countries, ASCCI	Agreement on regional automotive market development plan to 2035
3. Localisation	DTI, DED, IDC, ASCCI	Post-2020 policy
4. Automotive infrastructure development	DTI, Transnet, SANRAL, local municipalities	Automotive infrastructure roadmap to 2035
5. Transformation	DTI, DED, IDC, ASCCI	Industry transformation baseline to be established
6. Technology and associated skills development	DTI, DST, Department of Labour, Department of Education, ASCCI	South African Technology and Skills Development roadmap to 2035

As highlighted in Figure 4, each of the pillars will need to be supported through clear institutional processes and an enabling set of automotive policies, which still need to be determined. A range of policy related issues lie at the heart of whether the South African automotive industry will realise its potential through to 2035. While the APDP presently sits clearly at the centre of the industry's existing strengths and weaknesses, given its conclusion in 2020, and the setting of the SAAM to 2035, there is an ideal opportunity to reshape South African automotive policy post-2020 to support the realisation of the 2035 vision and its associated objectives. Critically, all policy decisions need to be assessed against their impact on this SAAM.

It is equally clear that the SAAM will need to be carefully monitored and evaluated to ensure that the industry progressively moves towards the targets set for 2035. This requires the establishment

of an authoritative SAAM support institution that is responsible for leading its implementation. The SAAM institution should play the key role of coordinating, monitoring, and evaluating the progress of the industry to 2035, ensuring each of the multifaceted and reinforcing objectives of the SAAM are consistently focused on, thereby ensuring implementation accountability across the spectrum of responsible stakeholders. The institution should ensure stakeholder alignment with the SAAM's vision and associated objectives and be recognised as the formal industry development council of the South African automotive industry. Chaired by the Minister of Trade and Industry and/or the Director General of the DTI, the institution should comprise the senior leadership of the South African automotive industry, inclusive of NAAMSA and NAACAM CEOs, NUMSA's most senior leaders, and selected representatives from the broader value chain, particularly where these representatives have a key role in implementing the pillars of the SAAM.

A base monitoring and evaluation framework will need to be developed for the SAAM, with the measures and the realisation of the associated targets presented in Table 9 integral to its success.

Table 9: Critical SAAM Key Performance Indicators (KPIs)

Objectives	Base	Targets			
	2015	2020	2025	2030	2035
Domestic market growth (units)	617,749	640,299	784,509	961,782	1,179,815
Domestic production market share (%)	44.9	53.1	54.7	55.7	59.0
SA production for domestic market (units)	277,179	340,001	428,999	535,797	695,994
Regional market growth (units)	50,000	100,000	200,000	400,000	700,000
SA production for regional market (units)	41,446	60,000	130,000	272,000	347,997
SA production for broader export markets (units)	289,677	304,161	319,369	335,337	347,997
Local content – up to (%)	38.7	43.2	48.2	53.8	60.0
Tier 2/3 Black-owned supplier contribution (%)	<1	10	15	20	25

The realisation of the SAAM is likely to be fraught with challenges through to 2035 and it is therefore critical that an institutional approach is taken to supporting its completion. The recommended institution should work to overcome challenges to the realisation of the SAAM, provide recommendations on shifts in policy and/or industry programmes where results are sub-optimal, and amplify the impact of SAAM successes whenever this is required. Evidence from competing economies is clear in this regard: *Successful automotive industries have not been built through one-off policy development processes, or the establishment of a single, effective industrial plan; but rather through the establishment of institutionalised learning processes that have proactively corrected policy and/or programme failures and worked to amplify successes wherever these have been experienced.*

The success of the SAAM consequently depends less on its content being 100% correct, and more on whether key industry stakeholders across the private and public spectrum believe in the vision and objectives set and are prepared to work together to achieve the outcomes that have been mutually agreed upon. The challenges in this regard are likely to be substantial, hence the importance of the quote from former president Thabo Mbeki that: "Those who complete the course will do so only because they do not, as fatigue sets in, convince themselves that the road ahead is still too long, the inclines too steep, the loneliness impossible to bear, and the prize itself of limited value." As the 2035 vision and the objectives in this Masterplan document reveal, the prize for the South African automotive industry, inclusive of all major stakeholders (firms, unions, government, and broader civil society) is of great potential value, hence its central importance to the future of the South African automotive industry.

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Appendix A: South African Automotive Masterplan Economics through to 2035

SAAM projections through to 2035 are based on the following calculations (all constant 2015 Rands):

1. Base 2015 figures derived from actual data (mainly NAAMSA)
2. Annual production extrapolated forward to achieve 1.392 million units in 2035, as follows:
    a. 4.5% for passenger vehicles
    b. 3.5% for LCVS
    c. 3.0% for M&HCVs[11]
3. Local content projected to increase 2.2167% annually (taking local content from 38.7% in 2015 to 60% in 2035)
4. Vehicle production values calculated at R225,804 per unit, which is the figure for NAAMSA OEMs for the first quarter of 2016
5. Employment growth subjected to 60.7496% productivity deflator, leading to employment doubling from 2015 to 2035
6. Local production and export spread for passenger vehicles and LCVs based on NAAMSA's projection for 2018 (hence no change in proportionate breakdown from 2020 to 2035)

Table 10: SAAM projections

Production	2015 (base)	2020	2025	2030	2035
Passenger vehicles (units)	**341,025**	**449,619**	**560,308**	**698,245**	**870,141**
PV - local market	112,566	118,681	147,898	184,308	229,682
PV – exports	228,459	330,938	412,409	513,937	640,459
PV - local market (%)	33.01	26.40	26.40	26.40	26.40
PV - exports (%)	66.99	73.60	73.60	73.60	73.60
LCVs	**242,974**	**286,049**	**339,737**	**403,501**	**479,232**
LCV - local market	140,310	147,459	175,136	208,006	247,046
LCV – exports	102,664	138,590	164,601	195,495	232,186
LCV - local market (%)	57.75	51.55	51.55	51.55	51.55
LCV - exports (%)	42.25	48.45	48.45	48.45	48.45
Light vehicles	**583,999**	**735,669**	**900,044**	**1,101,746**	**1,349,373**
LVs - local market	252,876	266,141	323,034	392,315	476,728
LVs - exports	331,123	469,528	577,010	709,431	872,645
LVs - local market (%)	43.30	36.18	35.89	35.61	35.33
LVs - exports (%)	56.70	63.82	64.11	64.39	64.67
M&HCVs	**24,303**	**27,353**	**31,710**	**36,760**	**42,615**
Total	**608,302**	**763,022**	**931,754**	**1,138,506**	**1,391,988**
Avg. value of SA vehicle	225,804	225,804	225,804	225,804	225,804
Value of production (Rm)	**137,357**	**172,293**	**210,394**	**257,079**	**314,317**
Local content (%)	38.70	43.18	48.19	53.77	60.00
Local content value (Rm)	**53,157**	**74,403**	**101,382**	**138,231**	**188,589**
Employment (productivity adjusted)	**112,000**	**129,570**	**151,882**	**182,355**	**224,000**

Note: The projections are not meant to reflect actual market breakdowns proposed within the SAAM through to 2035, e.g. the continued high level of PV exports is likely to be unsustainable, as is the level of PV importing. The model rather captures the economic benefits of achieving the SAAM's production objectives (vehicle aggregates, local content levels, employment levels, etc.) through to 2035.

[11] Off highway vehicles/yellow metal not included in the model.