RECOMMENDATIONS TO ADVANCE SOUTH AFRICA'S NEW ENERGY VEHICLE MARKET AND DOMESTIC SUPPLY CHAIN

Compiled by the New Energy Vehicle Project Team
Justin Barnes, B&M Analysts
Gaylor Montmasson-Clair, TIPS
Lesego Moshikaro, TIPS
Mbongeni Ndlovu, B&M Analysts

For the Department of Trade, Industry and Competition

February 2022

Trade & Industrial Policy Strategies (TIPS) is a research organisation that facilitates policy development and dialogue across three focus areas: trade and industrial policy, inequality and economic inclusion, and sustainable growth.

info@tips.org.za
+27 12 433 9340
www.tips.org.za

B&M Analysts

Sustainable growth through innovative solutions for leading industrial sectors.

admin@bmanalysts.com
+27 31 764 6100
www.bmanalysts.com

CONTENTS

Acknowledgements and disclaimer 3
Abbreviations 4
Executive summary 6
1. Introduction 8
1.1. Report context 8
1.2. South Africa's NEV challenge 9
1.3. Methodology 10
1.4. Report structure 11
2. South Africa's NEV roadmap to 2035 11
2.1. South African market shift to NEV, with no incentives 12
2.2. South African NEV transition issues 16
3. Key demand-side considerations 17
3.1. Domestic market NEV demand growth 17
3.2. European Union NEV market access 19
3.3. NEV market homologation alignment 19
4. Key supply-side considerations 20
4.1. Global Value Chain changes 20
4.2. Successfully restructuring the domestic value chain 21
4.3. CKD duty exposure on high-value electric components 24
4.4. AIS augmentation to support NEV-related investments 25
5. Policy recommendations 28
5.1. NEV subsidy for new vehicle purchases 28
5.2. Align SADC-EU EPA tariffs with ICE 30
5.3. CKD duty rebate on electrical components 30
5.4. Increased AIS for NEVs 31
5.5. Summary of recommendations 31
6. Conclusion 34
References 36
Appendix A 37

ACKNOWLEDGEMENTS AND DISCLAIMER

Benchmarking and Manufacturing Analysts (Pty) Ltd (B&M Analysts) and Trade & Industrial Policy Strategies (TIPS), as the service providers commissioned by the Department of Trade and Industry (**the dtic**) and **naamsa** I The Automotive Business Council to undertake this project, take full responsibility for the content and production of this report. Any omissions or errors are those of the authors alone.

The report's authors however fully acknowledge the contribution made by various stakeholders to the report, including Original Equipment Manufacturers (OEMs) and component manufacturers, industry associations, government departments and industry support institutions through one-on-one interviews, broader sectoral engagements, and participation in the Project Steering Committee.

ABBREVIATIONS

AIS	Automotive Investment Scheme
APDP	Automotive Production Development Programme
B&M Analysts	Benchmarking and Manufacturing Analysts (Pty) Ltd
BBBEE	Broad-Based Black Economic Empowerment
BEV	Battery Electric Vehicle
CBU	Completely Built Unit
CKD	Completely Knocked Down
dtic (the)	Department of Trade, Industry and Competition
EMA	European Market Area
EPA	Economic Partnership Agreement
EU	European Union
GDP	Gross Domestic Product
GVC	Global Value Chain
HEV	Hybrid Electric Vehicle (non-plug in, self-generating)
HFCEV	Hydrogen Fuel Cell Electric Vehicle
ICE	Internal Combustion Engine
LCV	Light Commercial Vehicle
M&HCV	Medium and Heavy Commercial Vehicle
MFN	Most Favoured Nation
MIDP	Motor Industry Development Programme
MVA	Manufacturing Value Added
naamsa	The Automotive Business Council
NEV	New Energy Vehicle
NPV	Net Present Value
OEM	Original Equipment Manufacturer
PHEV	Plug-in Hybrid Electric Vehicle
PI	Production Incentive
SA	South Africa
SAAM	South African Automotive Masterplan
SADC	Southern African Development Community
TCO	Total Cost of Ownership
TIPS	Trade & Industrial Policy Strategies
UK	United Kingdom
US	United States
VALA	Volume Assembly Localisation Allowance
VAT	Value Added Tax
VOP	Value of Production
X-HVCs	Extra Heavy Commercial Vehicles

EXECUTIVE SUMMARY

The South African government's Green Paper, *Auto Green Paper on the Advancement of New Energy Vehicles in South Africa* (**the dtic**, 2021), explores the advancement of New Energy Vehicles (NEVs) in South Africa. The NEV Green Paper advocates for the acceleration of NEV consumption and production in South Africa in a way that aligns with the global NEV trajectory. According to the paper, South Africa aspires to have NEVs representing 60% of the market by 2035, of which Hybrid Electric Vehicles (HEVs) would comprise 10%, Plug-in Hybrid Electric Vehicle (PHEVs) 20% and Battery Electric Vehicles (BEVs) 30%. However, as highlighted in the *South African New Energy Vehicle Research Report* (Key Findings Report, Barnes, et.al, 2021), the average price differential relative to comparative ICE models is 12% for HEVs, 43% for PHEVs and 52% for BEVs. If the South African market were forced to transition to NEV consumption without any form of incentivisation and these price differentials were forced to be borne by the consumer, the domestic vehicle market would contract substantially, massively damaging the South African fiscus and an automotive industry that sits at the heart of the country's manufacturing sector.

Given the recent poor performance of the South African domestic vehicle market due to the stagnation in middle class consumption in South Africa, and the devastating consequences of the COVID-19 pandemic, the South African Automotive Masterplan's (SAAM's) projected domestic market of 1.2 million units in 2035 is no longer deemed plausible and has not been used in our calculations. Rather, based on an average annual compounded growth rate of 3.5%, a South African light vehicle market of only 670 140 units is estimated in 2035. This would decline by 31.6% to as low as 458 523 units under a scenario of NEVs comprising 60% of the domestic market with no market incentives for NEV consumption. These market declines would significantly impact the domestic vehicle industry and the broader South African economy, while also substantially reducing the government's fiscal intake from the industry.

The South African NEV Project Team's recommendations to support the transition of the South African automotive industry to a NEV dominated market, while continuing to develop the local industry in alignment with the objectives of the SAAM, are summarised in Table 1.

The table also outlines the underlying rationale and conditions required to optimally support the recommendations. Only through the balancing of both demand-side and supply-side considerations can the future of the South African automotive industry be secured as it navigates the complex one-in-100-year transition it is going through at present.

Table 1: Recommendations to support the South African automotive industry's NEV transiton to 2035

RECOMMENDATIONS	RECOMMENDED LEVEL OF SUPPORT	CONDITIONS	INDUSTRY BENEFITS	FISCAL COST
1. Introduce NEV purchasing subsidy	• R20 000 subsidy for the purchase of HEVs (to 31 December 2030); R40 000 for PHEVs, and R80 000 for BEVs (to 31 December 2035) to drive increased NEV consumption • Subsidies to be reviewed periodically and adjusted based on	• HEVs only supported if vehicle can be driven only in full electric mode • Subsidies only available for European Market Area (EMA) homologated NEVs	• Closure of price gap between NEVs and Internal combustion engine (ICE) vehicles in South African market • 20% of South African market comprising NEV sales in 2025, 40% in	• R7.6 billion to 2025, R31.9 billion to 2030, and R94.5 billion to 2035

RECOMMENDATIONS	RECOMMENDED LEVEL OF SUPPORT	CONDITIONS	INDUSTRY BENEFITS	FISCAL COST
	NEV cost competitiveness changes over time (relative to ICE vehicles)		2030 and 60% in 2035 • South African market alignment with EMA market developments	
2. Align NEV EMA Economic Partnership Agreement (EPA) tariffs	• South African-based OEMs to secure long-term duty-free access to the EMA – European Union (EU) and United Kingdom (UK) – market to secure existing South African vehicle production models • NEV models produced in the EMA to be available in South Africa at competitive pricing levels (through the reduction of BEV tariffs from 25% to 18%), as per the existing EPA	• EMA tariff reduction to be reciprocal • PHEVs with sub-1 000cc ICEs from the EMA to incur 18% Completely Built Unit (CBU) duty, per the balance of NEVs and ICE vehicles	• Continued access of South African OEMs to the EMA • Cost competitive EMA vehicles in the South African market	• None, will maintain the industry's status quo in respect of two-way trade flow between the EMA and South Africa
3. Provide 50% Completely Knocked Down (CKD) rebate on NEV electrical components	• South African-based OEMs to be protected from the adverse impact of 20% CKD duties on expensive NEV components, as they transition to NEV vehicle assembly	• No conditions on NEV CKD components to 31 December 2025 • NEV module assembly requirements from 2026 to 31 December 2030, then full removal of rebate	• Reduction in CKD duty costs for OEMs assembling NEVs	• None. Rebate worth R1.5 billion to OEMs annually, but in face of R2.9 billion in additional costs if no local sourcing of NEV components
4. Increase Automotive Investment Scheme (AIS) support for NEV investment	• Increase maximum AIS from 30% (OEMs) or 35% (component manufacturers) to 50% for NEV investments	• All NEV components to qualify • Remove AIS's Broad-Based Black Economic Empowerment (BBBEE) and employment	• Automotive industry investments to increase by up to 30% annually	• Additional AIS support of up to R68.4 billion to 2035

RECOMMENDATIONS	RECOMMENDED LEVEL OF SUPPORT	CONDITIONS	INDUSTRY BENEFITS	FISCAL COST
		conditions on NEV investments		
5. Maintain balance of Automotive Production Development Programme (APDP) incentives	• Maintenance of existing levels of APDP support	• APDP to be reviewed in 2025, to consider policy amendment post 2026 • All the recommendations included in this report to be reviewed as part of the overall APDP review	• Volume Assembly Localisation Allowance (VALA) and Production Incentive (PI) continue to provide major localisation incentive for OEMs • PI continues to provide major incentive for aftermarket and export focused component manufacturers	• No change on base APDP benefits

The recommendations, as presented in Table 1, should meet **the dtic** brief set for the project:

- Support South Africa's continued market development, ensuring sales do not decline because of higher NEV costs.
- Support the successful transition of the South African light vehicle market from an ICE vehicle dominated market, to a low-carbon emitting market dominated by NEV consumption.
- Secure South African production access to the EMA as the key EU and UK markets transition to NEV consumption only.
- Support the competitiveness of domestic vehicle assemblers and their local supply chains in the South African NEV market by reducing the duty burden on expensive imported NEV components.
- Attract NEV investment through the South African automotive value chain, in preparation for the removal of NEV CKD duty rebates in 2030.
- Incentive NEV assembly and component production in South Africa, thereby positioning the industry for future growth and development.

It is important to emphasise that this report is intentionally positivist in its recommendations. It endeavours to resolve a "wicked problem" that is inherently complex. As set out in the brief for the project, how can South Africa transition both its market and its production to NEVs, while simultaneously achieving the objectives set within the SAAM? All recommendations are framed to achieve this positive outcome.

1. INTRODUCTION

1.1. Report context

This policy recommendations report is submitted to the Department of Trade, Industry and Competition (**the dtic**), Republic of South Africa, as the final deliverable of the New Energy Vehicle Project being co-funded by Trade & Industrial Policy Strategies (TIPS)[1] and **naamsa** I The Automotive Business Council. The report has been compiled by a team of consultants based at Benchmarking and Manufacturing Analysts (B&M Analysts) and TIPS. The report details a potential electric vehicle roadmap for South Africa, and an associated set of automotive sector policy recommendations for **the dtic.** Critically, the policy recommendations are intended to drive the realisation of the proposed electric vehicle roadmap, while simultaneously supporting the realisation of the South African Automotive Masterplan (SAAM), which runs until 2035. The report is therefore intentionally positivist in its recommendations. It endeavours to resolve a "wicked problem" that is inherently complex. Per the brief set for the project, how can South Africa transition both its market and its production to NEVs, while simultaneously achieving the objectives set within the SAAM? All recommendations presented in this report are framed to achieve this positive outcome.

The report is based on extensive international and domestic research completed over the second half of 2021, as well as a range of engagements with industry stakeholders, which were completed over the period October to December 2021.

The importance of the recommendations presented in this report is underpinned by the fact that almost all vehicle production and consumption in South Africa is ICE based. Yet, the majority of South African vehicle and related automotive component production is exported, with the primary export markets being the EU and the UK. Combined, these two markets consume the vast majority of South African vehicle and component exports; and yet governments in the EU and the UK have both announced timeframes within which they will phase out ICE consumption in their markets, and shift to NEVs. These shifts in South Africa's major export markets represent a potentially existential threat to the South African automotive industry, and the aspirational targets that have been set in the SAAM for 2035:

- Local production of 1.4 million units, or 1% of global production
- 60% local content in South African vehicles
- Doubling of employment off 2016 levels
- Transformation of Tier 2 component manufacturing and dealership operations
- Deeper technical capabilities, and more advanced infrastructure and skills in the South Africa automotive industry.

As South Africa's most successful and important manufacturing sector, it is critical to the domestic economy that the automotive industry achieve its potential through to 2035, as scoped within the SAAM. At the same time, it is also recognised that the South African vehicle market and broader transportation industry needs to become substantially more environmentally sustainable over the period of the SAAM, and that growth in domestic NEV consumption is as important an objective as the development of the industry. This is recognised in the *Green Transport Strategy for South Africa: (2018-2050)* (Department of Transport, 2018).

The South African government recently published a Green Paper (**the dtic**, 2021), exploring the advancement of NEVs in South Africa. Titled *Auto Green Paper on the Advancement of New Energy*

[1] On behalf of **the dtic.**

Vehicles in South Africa, the document, which was released for public consultation on 21 May 2021, advocates for the acceleration of NEV consumption and production in South Africa in a way that aligns with the global NEV trajectory. The Green Paper identified two major strategic imperatives for the South African automotive industry. First, secure South Africa as a global manufacturing base (for NEVs and ICE vehicles); and second, support NEV component localisation over the next 10-15 years.

The Green Paper findings were substantially augmented over the first phase of this project. International NEV policy developments and OEM strategies were detailed in a Key Findings Report,[2] which identified the need for the urgent implementation of the NEV transition within the South African automotive industry. The findings presented in the Key Findings Report suggest that the transition to NEV consumption and production in South Africa is inevitable. However, driving an earlier and more meaningful NEV transition in South Africa will require a careful balance between incentivising a sustained shift in domestic market demand to NEVs; establishing an appropriately aligned, renewable energy-based charging infrastructure; and supporting a shift in South African vehicle production, away from ICE vehicles to a mix of HEVs, PHEVs, and BEVs. Balancing these factors is key to successfully transitioning the South African vehicle industry to an ultra-low carbon future, while simultaneously ensuring it remains a major contributor to the industrial development of the domestic economy, as per the objectives of the SAAM.

1.2. South Africa's NEV challenge

How the South African government supports the industry and its complex value chain to make the NEV transition is replete with challenges, the most notable of which is the major cost associated with transitioning to the consumption and production of more expensive vehicles – at least for a period, until battery technologies advance to levels that secure their price parity with equivalent ICE products.

The South African market is highly price sensitive, especially in the two lowest quintiles of market consumption (price elasticities of -1.795 and -1.95, respectively) (Barnes and Grant, 2019), hence the almost non-existent NEV sales in the domestic market, except in the apex quintile. This creates a major misalignment in the development trajectory of the South African market relative to the local automotive industry's most important export markets of the EU and UK. These markets, which jointly consume a similar number of South African assembled vehicles as supplied into the domestic market, will likely be consuming BEV-only by 2035. This raises a striking challenge for the multinational OEMs operating in South Africa. Their domestic business case is a precarious one, as they need to supply vehicles into South Africa and to major export markets to achieve sufficient scale economies to operate at internationally competitive levels. To maintain this balance in future, it is critical that domestic and international market demand shifts are broadly aligned.

This does not mean that consumption in the South African and EU/UK markets needs to be fully aligned in the timing and the profile of NEV consumption. Consistent with most developing economies, with substantial automotive industries, South Africa is starting its NEV transition slightly later; and has distinctive geographical and operating parameters (such as road conditions, vehicle use factors, income distribution, consumption patterns) that will impact the nature of its NEV transition. For example, while the NEV transition for passenger vehicles is likely to be slightly longer in South Africa than in the EMA[3], there is a strong likelihood that Light Commercial Vehicle (LCV) demand in South Africa will remain hybrid-based for the period to 2035, with LCV-HEVs potentially being replaced primarily with PHEVs, as opposed to a full transition to BEVs.

[2] See Barnes, et al (2021), South African New Energy Vehicle Research Report.

[3] The term European Market Area (EMA) is used to describe the EU and UK markets in the balance of the report.

Recommending to **the dtic** how to support the automotive industry's transition to domestic NEV consumption and associated domestic NEV production is the focus of this report. It provides a comprehensive set of policy recommendations for **the dtic** and **naamsa** to consider in respect of:

1. Optimally increasing NEV consumption and production in South Africa, with NEVs to comprise 15%-20% of the domestic market by 2025 and 30%-40% by 2030. This set of targets broadly aligns with transition objectives set in the world's major vehicle markets.
2. Supporting the achievement of the SAAM's key objectives through to 2035.

1.3. Methodology

The policy recommendations presented in this report are derived from a comprehensive research process, encompassing the completion of nine activities.

- First, the team reviewed NEV, vehicle carbon emission, and green transportation reports completed in South Africa and internationally, while simultaneously interrogating NEV developments in the key export markets of the EU and UK. These reports are referenced in the Key Findings Report.
- Second, the team completed a desktop-based review of NEV production and consumption support being provided by governments in selected competitor economies to South Africa. These included Turkey, Thailand, Malaysia, Brazil, Mexico, Hungary, Poland, India, Egypt and Morocco. These are the same economies that were included in SAAM's review of South African competitor economies.
- Third, and again on a desktop-basis, the project team explored the price differentials of comparable NEV and ICE vehicles in the South African and selected international markets. These markets included the UK, France, Australia, Thailand and Turkey, with the analysis encompassing the full range of NEVs: HEVs, PHEVs, and BEVs.
- Fourth, the project team surveyed and/or interviewed a selection of **naamsa**'s light vehicle and Medium and Heavy Commercial Vehicle (M&HCV) members (including bus assemblers). The research instrument focused on interrogating the introduction of NEV models in the South African market; potentially appropriate price premiums between ICE and NEVs to stimulate local market NEV consumption; OEM recommendations (and supporting information) on NEV government policy support required for domestic market consumption and local production; and insights into NEV component localisation opportunities and challenges. The details of these surveys and/or interviews are included in the Key Findings Report.
- Fifth, the project team reviewed previous local and international research on NEV component opportunities, and then analysed these findings in relation to the OEM survey/interview inputs on NEV component opportunities and challenges.
- Sixth, the project team modelled the South African market and industry's potential NEV transition roadmap per the project's terms of reference, and over the full period of the SAAM.
- Seventh, the team explored a range of potential policy recommendations (including potential changes to the APDP to support an effective transition to NEV consumption and production in South Africa. This included an exploration of the feasibility of the recommendations, and the modelling of potential costs to the South African fiscus.
- Eighth, the team tested initial model findings and associated preliminary recommendations with industry stakeholders. This engagement process secured a range of inputs on the findings generated.
- Ninth, the project team consolidated its recommendations based on the inputs received and compiled this final report.

1.4. Report structure

This report comprises six sections and a set of supporting appendices.

Following this introduction, Section 2, explores the NEV roadmap proposed for South Africa. Considering the European Market Area's shift to NEVs and South Africa's own environmental priorities, this section outlines a proposed NEV transition framework for the South African automotive industry to 2035.

Section 3 then considers key demand side issues framing the potential successful transition to NEV consumption.

Section 4 shifts the focus to the automotive supply chain and considers the key supply-side challenges framing the successful transition to NEV production in South Africa.

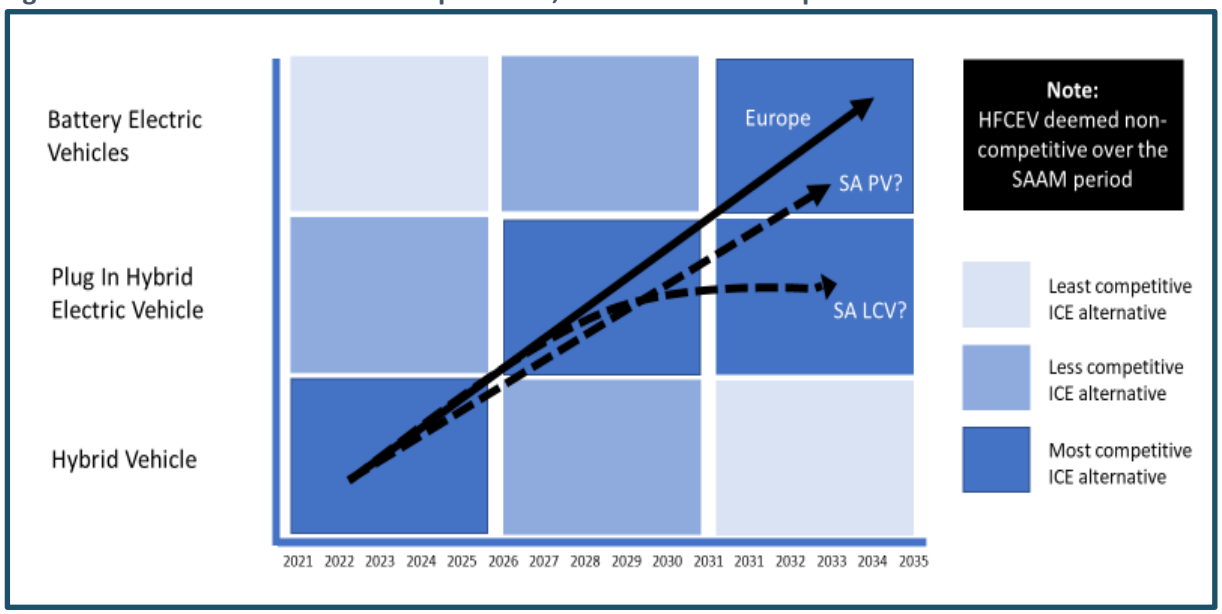
Section 5 represents the heart of the report. Building on the findings presented in the previous sections, it lays out the project team's key policy recommendations.

Section 6 comprises a short conclusion.

2. SOUTH AFRICA'S NEV ROADMAP TO 2035

The South African NEV roadmap for light vehicles through to 2035 is presented in Figure 1. The solid line depicts the anticipated EMA trajectory. As highlighted, the EMA is projected to fully transition its market to BEV-only sales by 2035. This transition is being driven by a mix of legislative changes that will essentially ban the sale of pure ICE vehicles by 2035, combined with generous fiscal incentives at national and subnational levels to purchase NEVs. Excluding government sanctions and/or incentives, the framework presented in Figure 1 recognises that HEVs are the most competitive alternative to ICE vehicles in the short term (to 2025), with PHEVs the most competitive alternative from around 2026 to 2030, and BEVs only becoming truly competitive (depending on vehicle market segments and use profiles) sometime from 2031 to 2035. However, the NEV roadmap depicted in Figure 1 is meant to be a guide rather than a definitive map. Timings may vary because of technology breakthroughs and/or blockages in a rapidly emerging, but ultimately immature NEV technological environment.

Figure 1: South African NEV roadmap to 2035, relative to the European Market Area



Source: Authors.

As further highlighted in Figure 1, the South African NEV roadmap is not projected to be entirely dissimilar to the EMA trajectory. The passenger vehicle market is expected to follow the same trend, albeit with some timing lags, given South African market price sensitivities and government fiscal weaknesses that make the aggressive sanctioning of ICE vehicle purchases and the generous incentivisation of NEV purchases less likely than in developed economies. There is also an important further distinction in the LCV market. The inherent weight and wind coefficient limitation that arises from the ladder-chassis-based technology underpinning LCVs makes it more difficult to engineer LCVs that are NEVs. In addition, South Africa not only has a much higher proportion of LCV sales than evident in the EMA, but LCVs in South Africa often play a multipurpose role in the domestic market, encompassing a range of commercial goods-based applications, and the movement of people. This is moreover evident across a wide range of road, topographical and climatic conditions, exposing LCVs to a wide assortment of use-profiles. Given these factors, there is potentially a longer time lag before BEV-LCVs are competitive in the domestic market (perhaps only after 2040)[4]. Consequently, PHEVs are expected to hold a competitive position in respect of LCVs for a potentially longer period in the South African market.

Finally, Hydrogen Fuel Cell Electric Vehicles (HFCEVs) are not expected to be competitive relative to BEVs in the light vehicle market within the time frame of the SAAM, hence the exclusion of this technology from the NEV roadmap to 2035. This does not, however, mean it will not be competitive in subsequent years, nor that it will be uncompetitive across all market segments. There is a strong likelihood that HFCEVs will be competitive in respect of Extra Heavy Commercial Vehicles (X-HCVs) by 2035, but the number of sales in this market segment are extremely small, and not the focus of this report.

2.1. South African market shift to NEV, with no incentives

If the NEV roadmap presented in Figure 1 accurately depicts the likely trajectory of the South African automotive market to 2035, what does this mean for actual levels of vehicle demand in the domestic market? This is a critical issue as NEVs are consistently still significantly more expensive than ICE vehicles internationally. As highlighted in the Key Findings Report, the average price differential relative to comparative ICE models is 12% for HEVs, 43% for PHEVs and 52% for BEVs. If the South African market were forced to transition to NEV consumption without any form of incentivisation and these price differentials were forced to be borne by the consumer, the domestic vehicle market would contract substantially, massively damaging the South African automotive industry.

The underlying reason for this very negative projection relates to the price sensitivity of the domestic market. As indicated in Table 2, the South African vehicle market is highly price sensitive, especially across the first two quintiles (vehicles with an average selling price of R175 135 and R260 798, respectively). These two market segments comprise almost half the South African market and would be decimated by major price increases.

[4] Another key driver of the roadmap depicted in Figure 1 relates to ongoing technology access. While the EMA's rapid transition to BEVs will likely close off South African access to ICE passenger vehicle technology developed in the EMA, an identical trajectory is highly unlikely for LCVs. The urban-rural, mixed-use profile of the South African LCV market is analogous to the LCV market profile of many developing economies in Latin America and Asia; and as such core LCV technology in the world's leading LCV markets (such as Thailand) may remain hybrid-based for a longer period.

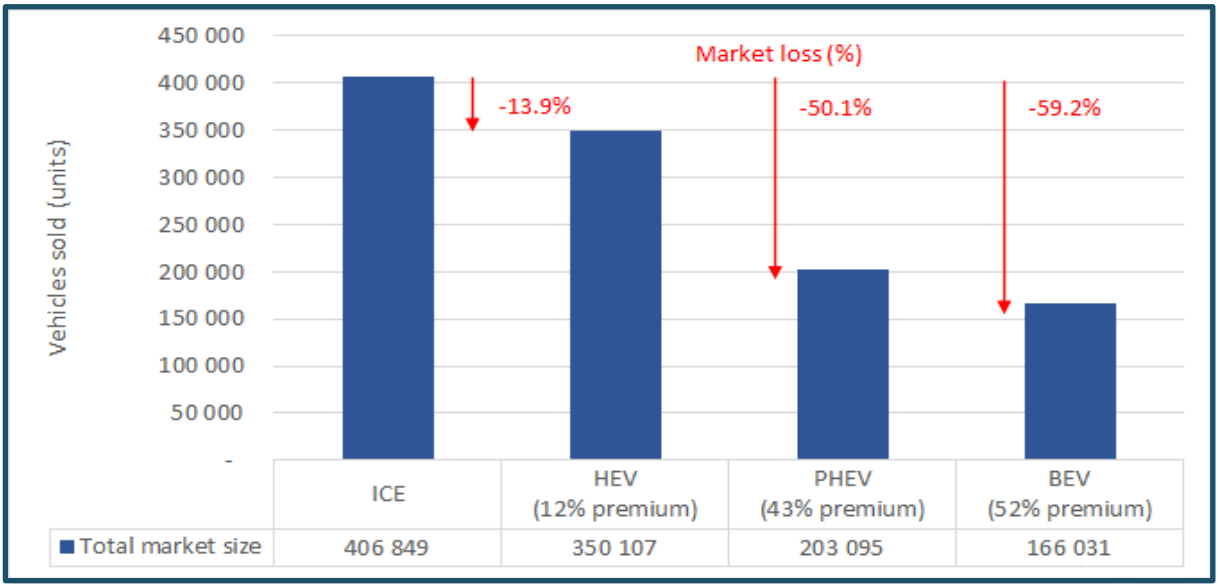
Table 2: Price elasticities by South African market segment, and the total market in 2020

MARKET SEGMENT	AVERAGE VEHICLE SALES VALUE	PRICE ELASTICITY	VEHICLES SOLD	TOTAL SALES REVENUE (M)
Quintile 1	R 175 135	-1,795	96 416	R16 886
Quintile 2	R 260 798	-1,95	97 810	R25 509
Quintile 3	R 359 765	-1,023	71 983	R25 897
Quintile 4	R 495 356	-0,236	97 536	R48 315
Quintile 5	R 876 554	-0,818	43 104	R37 783
Total	R 379 476	-1,162	406 849	R 154 389

Source: Barnes and Grant (2019). *Note:* The price elasticities are calculated off 12 years of South African dealership data (2007-2018), with the number of vehicles sold and the actual Rand figures of vehicles sold derived from 2018 dealership sales (i.e., total domestic market sales, excluding government, car rental and direct vehicle sales).

Based on the price elasticities presented in Table 2, the project team calculate a major potential decline in vehicle sales from 2020 to 2035. The findings are presented in Figure 2, and as revealed, using 2020 vehicle sales as the market base, sales of 406 849 units would contract to 350 107 units under a scenario of HEV sales only, 203 095 units for PHEVs only, and to only 166 031 units if the market comprised exclusively of BEVs. These would represent market contractions of 13.9% (HEVs), 50.1% (PHEVs) and 59.2% (BEVs), respectively.

Figure 2: Modelled vehicle sales for 2020 based on market price elasticities and NEV price premiums



Source: Authors. *Note*: The figure presented is exploratory, depicting a theoretical consequences of a forced NEV transition in the South African market. It assumes a set of NEV price differentials, as derived from the project's Key Findings Report, and established market price elasticities.

Given the recent poor performance of the South African domestic vehicle market due to the stagnation of middle-class incomes, and the devastating consequences of the COVID-19 pandemic, the SAAM's projected domestic market of 1.2 million units in 2035 is no longer deemed plausible and has not been used in the calculations. Rather, based on average annual compound growth rate of 3.5%, we estimate a South African light vehicle market of only 670 140 units in 2035, with this being

as low as 458 523 units (a decline of 31.6%) under a scenario of NEVs comprising 60% of the domestic market[5], and with no market incentives for NEV consumption.[6]

These market declines would significantly impact the domestic vehicle industry and the broader South African economy, while also substantially reducing the government's fiscal intake from the industry. This is highlighted in Table 3, which shows that the shift to NEVs, as outlined in Figure 2, would have resulted in the government losing up to R9.8 billion in taxes in 2020. This is based on the government's fiscal revenue from vehicles sales reducing from R36.9 billion to R27.1 billion. Government revenue losses are derived from lower value added tax (VAT), ad valorem, carbon tax, and tyre levy recoveries.

Table 3: Government tax losses based on different NEV consumption profiles relative to ICE (2020 market data)

VEHICLE TYPE	PRICE PREMIUM	MARKET SALES (RM)	GOVERNMENT TAXES (RM)	GOVERNMENT NET TAX POSITION (RM)
Internal Combustion Engine (ICE)	-	R 154 389	R 36 937	
Hybrid Electric Vehicle (HEV)	12%	R 153 655	R 35 997	-R 940
Plug in Hybrid Electric Vehicle (PHEV)	43%	R 130 246	R 30 160	-R 6 778
Battery Electric Vehicle (BEV)	52%	R 119 875	R 27 118	-R 9 819

Source: Authors.

Based on base NEV price differentials, substantial subsidies would have to be provided to equilibrate market sales back to ICE levels. The average level of subsidisation is presented in Table 4 and, as revealed, it ranges from R61 305 for HEVs to R222 639 for BEVs. These figures are, however, substantially inflated by high-value vehicles and are significantly lower for vehicles in market quintiles 1 and 2. These are the most price sensitive markets and hence the segments that would most benefit from price equilibrium being achieved. For example, the average level of subsidisation required to achieve equilibrium for quintile 1 vehicles ranges from R17 853 for HEVs to R81 799 for BEVs[7] and R29 671 to R127 917 for quintile 2 vehicles. Based on South African market price elasticities, the average subsidy that would be required to equilibrate the market would be R61 305 for a HEV, R189 626 for a PHEV and R222 639 for a BEV. This would equate to a R25.9 billion subsidy per year.

Table 4: Levels of subsidisation required per vehicle to maintain aggregate market sales at ICE levels, by quintile

VEHICLE TYPE	PRICE PREMIUM	AVERAGE SUBSIDY NEEDED PER VEHICLE: TOTAL MARKET	QUINTILE 1: SUBSIDY NEEDED	QUINTILE 2: SUBSIDY NEEDED
Hybrid Electric Vehicle (HEV)	12%	R 61 305	R 17 853	R 29 671
Plug in Hybrid Electric Vehicle (PHEV)	43%	R 189 626	R 69 411	R 107 674
Battery Electric Vehicle (BEV)	52%	R 222 639	R 81 799	R 127 917

Source: Authors.

If the South African vehicle market were to transition NEV sales equal to 20% of the total market in 2025, 40% in 2030 and 60% in 2035, the profile of NEVs sold is likely to shift quite dramatically over the period. HEVs would likely dominate in the period to 2025 (10% of the 20% total), with PHEVs and BEVs ending the period in a similar market position (5% each). However, BEVs are then projected to

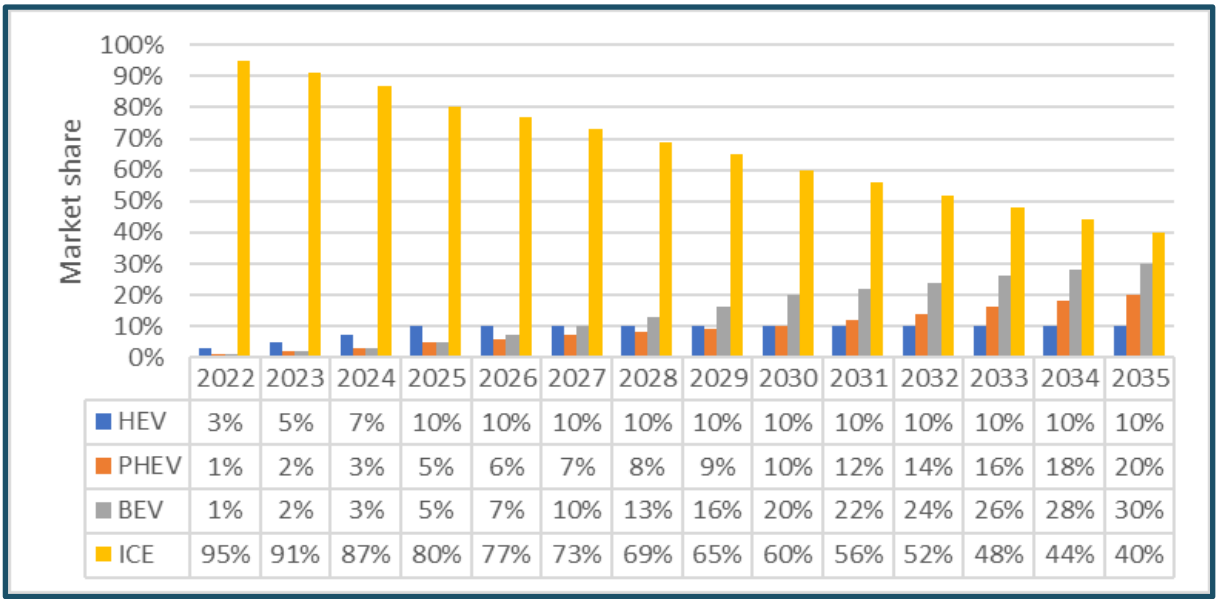
[5] This is based on the NEV roadmap projection of 60% of the total market comprising NEVs in 2035, of which HEVs would comprise 10%, PHEVs 20% and BEVs 30%.

[6] We have used the Terms of Reference set for the project to guide the calculations presented, so a target of 20% NEVs sold in the South African by 2025, 40% by 2030 and 40% by 2035.

[7] Appendix A contains the full breakdown of required subsidies per market quintile.

dominate the NEV market segment, achieving half of the 40% total in 2030 and 60% of the NEV total in 2035. The South African market's potential shift to NEVs is presented in Figure 3.

Figure 3: Potential South African market shift to NEVs to 2035

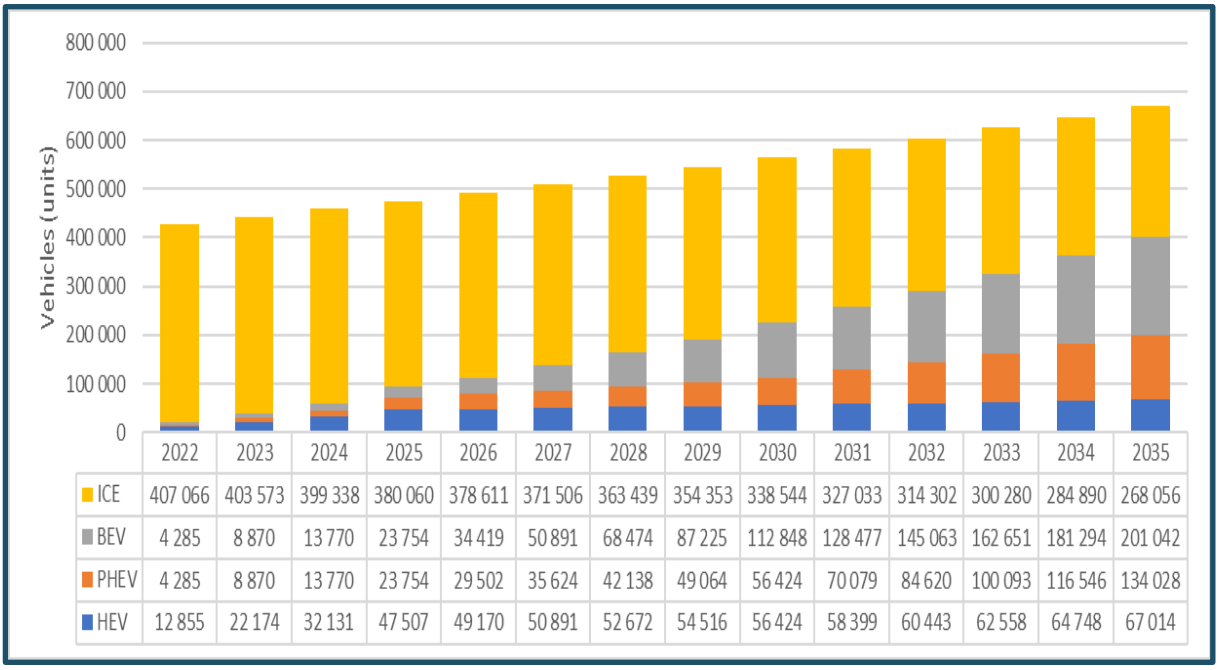


	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
HEV	3%	5%	7%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
PHEV	1%	2%	3%	5%	6%	7%	8%	9%	10%	12%	14%	16%	18%	20%
BEV	1%	2%	3%	5%	7%	10%	13%	16%	20%	22%	24%	26%	28%	30%
ICE	95%	91%	87%	80%	77%	73%	69%	65%	60%	56%	52%	48%	44%	40%

Source: Authors.

If the NEV transition, as presented in Figure 3, were to be achieved, it would result in major structural changes to the developing automotive market over the period to 2035. BEV sales would, for example, increase from 4 285 units in 2022 to 201 042 units in 2035, while ICE vehicle sales would decline from 407 066 to 286 056 units over the same period. HEV and PHEV sales would reach 67 014 and 134 028 units respectively in 2035, hence the overall dominance of NEVs in the domestic market by the end of the period.

Figure 4: Projected light vehicle sales in the South African market to 2035, per the NEV transition



	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
ICE	407 066	403 573	399 338	380 060	378 611	371 506	363 439	354 353	338 544	327 033	314 302	300 280	284 890	268 056
BEV	4 285	8 870	13 770	23 754	34 419	50 891	68 474	87 225	112 848	128 477	145 063	162 651	181 294	201 042
PHEV	4 285	8 870	13 770	23 754	29 502	35 624	42 138	49 064	56 424	70 079	84 620	100 093	116 546	134 028
HEV	12 855	22 174	32 131	47 507	49 170	50 891	52 672	54 516	56 424	58 399	60 443	62 558	64 748	67 014

Source: Authors.

2.2. South African NEV transition issues

The NEV transition outlined recognises that South Africa is similarly positioned to other Tier 2 automotive economies. The national strategies being followed by these economies were documented in the Key Findings Report. Fundamentally, as with South Africa, they are grappling with how to successfully transition their domestic markets to NEVs, while simultaneously continuing to develop their local automotive industries. This has resulted in a lagged NEV response relative to the EMA and other developed economies. Fundamentally, very few NEV sales are being recorded in any Tier 2 automotive economies. Consistent with South Africa, the Tier 2 automotive economies are constrained by market affordability challenges, and a policy development tension framed by the need to balance market and production considerations.

South Africa is however lagging other Tier 2 economies in three critical areas.

1. The South African and the broader regional market is non-dynamic, with only limited projected growth over the next decade. As per the market sales projection presented in Figure 4, the growth in NEV sales in South Africa will therefore displace ICE sales, as opposed to generating additional aggregate sales in the market. This is a major strategic weakness. The local automotive industry will see an increasing share of its local market supply displaced by NEVs, resulting in an increasingly fragmented and small domestic market that offers limited model volume opportunities for local OEMs (whether NEV or ICE vehicles).
2. Facing a small, fragmented domestic market and even smaller regional market, local OEM assembly operations are set to remain dependent on exports to the EMA. This could force a far more rapid supply chain shift to NEVs in South Africa than will be the case in other Tier 2 automotive economies with larger, more rapidly growing domestic and/or regional markets. Without a larger domestic or regional market, the domestic automotive industry will be forced to develop in alignment with the EMA's much more aggressive NEV transition.
3. The South African government lags other Tier 2 automotive economies by not having an explicit NEV-policy framework. NEV-specific demand- and supply-side support is absent at present, with and the roadmap going forward unclear, hence the importance and urgency of this report. The NEV transition profiled in Figure 3 and Figure 4 will not materialise organically on the basis of the market's present trajectory; and yet it may be a requirement for the continued development of the domestic automotive industry, and the maintenance of its critical industrial development role in South Africa.

South Africa's developed and developing economy global competitors appear to be better positioned in responding to NEV developments. It is therefore critical that the SAAM's policy framework, which is framed as APDP-2, is adjusted to support the NEV transition outlined in this section. Doing so will require policy shifts in supporting NEV demand growth (to achieve 20% NEV market share in 2025, 40% in 2030, and 60% in 2035), and NEV production development.

These two elements are explored separately in Section 3 (key demand-side considerations) and Section 4 (key supply-side considerations).

3. KEY DEMAND-SIDE CONSIDERATIONS

3.1. Domestic market NEV demand growth

The fundamental challenge to NEV market growth in South Africa is the uncompetitive pricing of NEVs relative to ICE vehicles. As highlighted in Section 1, the average international pricing gap for NEV models relative to their ICE equivalents is 12% (for HEVs), 43% (for PHEVs), and 52% (for BEVs). While the price gap has narrowed as battery technologies advance, NEV sales in developed economies are consequently heavily subsidised.

If subsidies are not provided, or if ICE vehicles are taxed substantially more heavily than their NEV counterparts, then NEV sales remain niche based. Generating a shift to large-scale NEV consumption in a highly price sensitive market like South Africa will therefore require significant incentivisation of demand. This is because the NEV transition in the EMA and other developed economies has been funded by a variety of purchasing subsidies that either narrow or eliminate the pricing gap between NEVs and ICE vehicles. In addition to purchasing subsidies, broader vehicle operating incentives have generated further Total Cost of Ownership (TCO) benefits for NEVs, thereby compensating for any price gaps that still exist after purchasing subsidies have been extended.

These findings are consistent with inputs from South African automotive stakeholders. The consensus is that NEVs can only be competitive at a small price premium of around 10% over their ICE equivalents in the South African market to sell at similar rates. Beyond this threshold there is a major decline in demand for NEVs, irrespective of any TCO benefits associated with the lower energy and maintenance costs of NEVs. Stakeholder interviews further emphasised that private vehicle ownership is especially sensitive to base vehicle price differentials, with TCO benefits only being a marginal consideration for the average consumer deciding to purchase a new vehicle.

Given the price sensitivity of the South African market, as exhibited by its price elasticity profile (see Table 2) and the substantial levels of subsidisation required to equilibrate NEV and ICE vehicle pricing, the most appropriate incentive model to support the transition to NEV consumption in the South African automotive market appears to be the provision of a direct, fixed NEV purchase subsidy. The value of the subsidy will be determined by the type of NEV being subsidised, the effectiveness of support for the planned NEV transition, and the cost of the incentive to the government fiscus. An incentive of this kind would optimise support for entry level NEVs, with less benefit for more expensive NEVs (which are likely to be purchased by wealthier, less price sensitive vehicle owners).

An alternative to a direct purchase subsidy is a differential tax regime for NEVs that substantially lowers their comparative price. In South Africa's case, and assuming that it would be politically unfeasible to adjust VAT, the tyre levy and the carbon tax, this would require the significant reduction of ad valorem excise taxes on NEVs, especially given their more expensive pricing, which raises their tax exposure and widens their comparative cost relative to ICE equivalents. The challenge with this alternative is that ad valorem taxes are lowest on entry priced vehicles, and then increase significantly at higher price points. The average Rand value of ad valorem tax on vehicles in different market quintile levels is depicted in Table 5 and, as revealed, equalising NEV price points through ad valorem changes is substantially easier at the expensive end of the market, which is not where subsidisation is most required. As an example, the total ad valorem tax on an average imported quintile 1 vehicle (average sales price of R170 049) is only R3 993, relative to R135 924 on an imported quintile 5 vehicle (average sales price of R970 921).

Table 5: Taxes paid on different South African market segments (2018 market data)

	Locally assembled vehicles: Market quintiles					Imported vehicles: Market quintiles					Local and imported vehicles: Quintiles				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Average. vehicle price	R185 380	R261 744	R366 397	R489 082	R654 058	R170 049	R259 915	R354 734	R504 339	R970 921	R175 135	R260 798	R359 765	R495 356	R876 554
Taxes per vehicle	R33 509	R44 653	R72 247	R104 050	R142 980	R37 186	R59 870	R86 520	R131 601	R312 505	R45 973	R67 863	R91 139	R123 436	R206 794
VAT	R24 180	R34 141	R47 791	R63 793	R85 312	R22 180	R33 902	R46 270	R65 783	R126 642	R22 844	R34 017	R46 926	R64 612	R114 333
Tyre levy	R82,80	R103,50	R103,50	R103,50	R172,50	R82,80	R103,50	R103,50	R103,50	R172,50	R82,80	R103,50	R103,50	R103,50	R172,50
Ad valorem	R3 216	R6 750	R13 571	R26 112	R43 302	R3 993	R9 903	R18 823	R38 200	R135 924	R7 703	R14 746	R20 955	R29 976	R46 201
Import Duty	R0	R0	R0	R0	R0	R6 485	R9 913	R13 529	R19 235	R37 030	R6 485	R9 913	R13 529	R19 235	R37 030
CO2 tax	R6 031	R3 659	R10 782	R14 041	R14 193	R4 444	R6 049	R7 795	R8 279	R12 737	R8 858	R9 084	R9 626	R9 511	R9 058
Vehicle price before taxes	R151 871	R217 092	R294 149	R385 032	R511 078	R132 864	R200 044	R268 213	R372 737	R658 416	R129 162	R192 935	R268 625	R371 919	R669 760

Source: Authors.

3.2. European Union NEV market access

In addition to stimulating domestic NEV market demand, a further key demand requirement for the South African automotive industry is ensuring continuity of EMA market supply as that major market transitions to full BEV consumption. A substantial portion of South African vehicle production is destined for the EMA; and it is integral to the production rationale of several major South African-based assembly plants and their major component manufacturers. At present, BEVs are excluded from the Southern African Development Community (SADC)-European Union (EU) Economic Partnership Agreement (EPA), also known as the SADC-EU EPA,[8] and it is essential that this is corrected. The EPA provides South African assembled vehicles and component manufacturers with duty-free access to the EMA, and it is imperative that this market advantage is maintained over the balance of the SAAM period.

In exchange for the South African automotive industry securing duty-free market access to the EMA as part of the EPA, the vehicle industry in the EMA secures preferential access to the South African market. At present EU and UK sourced BEVs incur a full most favoured nation (MFN) tariff of 25% when supplied into the South African market, relative to an 18% EPA tariff for ICE vehicles (SARS, 2021). This 7% preference exposes emerging South African NEV market to more intensive EU competition but is an acceptable trade-off given the importance of securing duty-free access to the EMA market for the South African automotive industry.

3.3. NEV market homologation alignment

According to the market breakdown to 2035 presented in Figure 4, further fragmentation of the small South African automotive market has potentially dire consequences for domestic production. Domestic market volumes remain insufficient to support volume production locally, with this looking to remain the case over the balance of the SAAM period. A further market demand requirement consequently relates to the homologation of South African NEV market standards with NEV standards set in the EU and UK. Industry stakeholders indicated that NEV standards in Asian markets vary substantially from those in the EMA, and it is essential that the South African NEV market does not develop in a way that permits multiple NEV standards, thereby further fragmenting the already small domestic market. By aligning South African NEV market standards with emerging standards in the EMA, the country has the best chance of optimally aligning its future NEV demand with that of the EMA, and thereby securing the opportunity for larger-scale NEV supply across the South African automotive value chain.

[8] And by implication, the post-Brexit agreement with the UK.

4. KEY SUPPLY-SIDE CONSIDERATIONS

4.1. Global Value Chain changes

As the global automotive value chain undergoes its fundamental NEV transformation over the next two decades, it is essential that the South African segment of the value chain successfully transform its productive capabilities in alignment with emerging requirements. Following the framework presented in Figure 1, the South African automotive value chain may have a slightly delayed transition to NEVs relative to the EMA, and PHEVs may occupy a larger position in the domestic market in 2035 by virtue of its strong LCV orientation, but the local value chain will ultimately need to transition in a similar manner to the Global Value Chain (GVC). While the shift to HEVs and PHEVs adds additional value to the existing automotive value chain (by virtue of the additional electric components added to ICE vehicles), the advent of BEVs fundamentally changes the value package in vehicles, with major portions of the existing value chain terminating and entirely new value chain elements emerging.

The changes are summarised in Table 6. As highlighted, the South African automotive industry will experience declining demand for a range of locally produced ICE components, including exhaust systems (including South Africa's most important component export, catalytic converters), mechanical brakes, air conditioning systems and other heat transfer products, as well as engines and their components. Conversely, a range of electrical components will increasingly be in demand, ranging from battery packs and their management systems, to electric traction motors and controllers, to high voltage harnesses, charging components and regenerative braking systems.

Table 6: Component and system losses and gains as BEVs replace ICE vehicles

ICE COMPONENTS LOST	BEV COMPONENTS GAINED
Engine	Battery pack and management system
Transmission	Electric traction motor and controller
Engine Control Unit	Thermal cooling system
Fuel tank, line, pump, filler	Electromechanical brakes (vacuum pumps)
Airconditioning system	High voltage harnesses
Mechanical brakes	Charging point
Exhaust system (including catalytic converter)	Regenerative braking systems
Radiator	

Source: Stakeholder interviews.

The South African automotive value chain is likely to face a three-stage NEV transition. In the first phase (which has already started, and which is likely to dominate the NEV transition to 2025), OEMs will incorporate HEV technologies in their existing/new locally assembled model ranges. This will add some cost to their assembly operations, but not fundamentally change them, nor threaten existing supply chains. Essentially, a limited set of electrical components will be added to the base ICE vehicle assembly process.

The second stage involves the introduction of PHEV technologies, with this taking place as part of their locally assembled model ranges, or as new PHEV-focused model ranges. As electric components are responsible for a much larger portion of the value of the PHEVs produced, and as ICE technology miniaturises, there is likely to be significantly more pressure on multinational OEMs to justify their local assembly operations at this point, especially if there is limited domestic demand for the more expensive PHEV models being assembled.

As PHEVs are likely to be the preferred ICE alternative in South Africa through the latter half of the 2020s (especially for LCVs), the challenge of adjusting to the second stage of the transition lies largely with the introduction of replacement/new models from around 2025. This PHEV transition stage, while significantly more challenging than the HEV transition, will pale in comparison to the BEV

transition, which will follow soon afterwards, or even in parallel with the PHEV transition. This is because BEV assembly will fundamentally displace significant segments of South Africa's automotive value chain, including the country's engine assembly, engine component manufacturing, catalytic converter manufacturing, exhaust manufacturing, and various high-value adding drivetrain components. Assembling BEVs is not significantly different to assembling ICE vehicles, insofar as both have painted bodies, a vast array of internal and external trim components and sub-assemblies, and laminated and toughened glass, but the value package and hence the economics of production change fundamentally. Aside from the very expensive electric components incorporated into a BEV, BEVs have much simpler drivetrains than their ICE vehicle counterparts and are therefore substantially simpler and hence cheaper to assemble than ICE vehicles.

The transition to NEV consumption globally and in the domestic automotive market consequently represents both a major opportunity and an existential threat to the South African automotive value chain. If firms can make the transition, major future business opportunities await, but if they are not successful in transitioning to the new NEV technologies, the imminent decline of the domestic automotive industry, and the 115 000 direct jobs it sustains, is a likely outcome. Given this challenge, how should the South African automotive value chain be supported to make the transition?

4.2. Successfully restructuring the domestic value chain

As per the existing structure of the domestic automotive value chain, key to a successful NEV transition is the maintenance of large volume vehicle assembly in South Africa. The South African government supports the domestic industry with this at present through the APDP, which has recently been extended to 2026, in alignment with the objectives of the SAAM. The APDP supports local vehicle assembly and local component production through four interlinked policy instruments, as outlined in Table 7.

The APDP replaced the Motor Industry Development Programme (MIDP) in 2013 and has been successful in supporting the development of the domestic automotive industry, despite negative domestic market conditions, rising local production costs associated with increasing energy and transportation costs, and local government service delivery failures.

Table 7: APDP benefits and their NEV impact

ELEMENT	SUPPORT PROVIDED	NEV CONSIDERATIONS
Tariffs	• 25% duty on light vehicle CBU imports, except for EU and UK sourced ICE vehicles above 1 000cc, where the CBU duty rate is 18%, and below 1 000cc, where the duty rate is 0% • 20% duty on CKD imports for vehicles assembled in South Africa for domestic market supply	• South African CBU market protection is technologically agnostic, except for (a) BEV imports from the EMA, which incur a 7% higher duty than their ICE counterparts, and (b) sub-1 000cc ICE vehicle imports from the EU and UK, which enter South Africa duty free • The impact of the BEV and sub-1 000cc duty anomalies are problematic for different reasons: because South Africa needs reciprocal access to the EMA market under the EU and UK EPA agreements; and sub-1 000cc because of future PHEV issues • The 20% CKD duty makes local OEMs less competitive in the domestic market because of the duties incurred on expensive electrical component imports. This is not an issue for re-exported products as CKD duties are only payable on vehicles assembled for the South African market

ELEMENT	SUPPORT PROVIDED	NEV CONSIDERATIONS
Volume Assembly Localisation Allowance	• VALA incentivises local assembly by providing qualifying OEMs with a local value addition incentive equal to 40% of the dutiable value of their local value addition. This equates to 8% of their local value addition • The 40% VALA reduces 1% annually to 35% (7% of local value addition) in 2026	• VALA is not directly impacted by the NEV transition. However, as it only incentives local value addition, any lost local production due to the NEV transition will reduce the benefit of the APDP received by domestic OEMs • Conversely, any NEV assembly or NEV components localised will receive a significant level of incentive for the value addition that takes place in SA
Production Incentive	• The PI is available to component firms and OEMs and is earned by the final manufacturer in South Africa • The PI uses the same value-adding base as the VALA for its calculation, but is more generous • The benefit is equal to 12.5% of a firm's manufacturing value added (MVA), as well any deemed supplier value addition	• Per VALA, the PI is not directly impacted by the NEV transition. The PI incentives local value addition, and the only negative consequence of the NEV transition is lost ICE-specific production • The PI will generously support both NEV assembly and NEV component production in South Africa (for NEV assembly, local aftermarket supply, and exports)
Automotive Investment Scheme	• Cash grant support for automotive investments of up to 35% for component manufacturers and 30% for vehicle assembly operations • Incentive is paid over three years	• The AIS is a generous investment incentive, but its BBBEE and employment qualification requirements make it less likely to be successful in attracting NEV investments • The NEV transition raises investment costs and increases risk. The AIS may not be attractive as an investment support measure, especially when considering competitor investment support levels. The AIS may also face liquidity challenges if major future NEV investments are secured, as these may be larger than existing brownfield extensions

Source: Authors.

A review of the APDP's policy elements in respect of the NEV transition reveals that it largely remains appropriate as the government's principal support for the automotive industry. This is demonstrated in Table 8 for South African vehicle assembly, using modelled 2020 benefits. As highlighted, the benefits received under a NEV transition remain constant. The only major variable that changes is the amount of CKD duty payable on locally assembled NEVs for domestic market consumption, and hence the overall level of APDP benefit secured. As revealed, domestic OEMs would lose 8.1% of their APDP benefits (excluding the AIS) under a HEV assembly model, 29.1% under a PHEV assembly model and 35.2% under a BEV assembly model. The base calculations underpinning the findings in Table 8 are included as Appendix B and emphasise that the key issue underpinning the decline in benefits is the explosion in duty-bearing imported CKD content, as opposed to any VALA or PI benefit losses.

Table 8: Modelled APDP benefits for local OEMs, based on ICE and NEV assembly

DOMESTIC MARKET PRODUCTION	ICE – APDP2 – 2021	HEV	PHEV	BEV
VALA benefits – per domestic unit	R 6 902	R 6 902	R 6 902	R 6 902
PI benefits – per domestic unit	R 10 785	R 10 785	R 10 785	R 10 785
VALA+PI benefit – per domestic unit	R 17 687	R 17 687	R 17 687	R 17 687
CKD duties payable – per domestic unit	R 23 829	R 28 759	R 41 495	R 45 193
Net position – per domestic unit	R -6 142	R -11 072	R -23 808	R -27 506

South African advantage as % VOP @18%	15.01%	13.19%	9.90%	9.19%
South African advantage as % VOP @25%	22.01%	20.19%	16.90%	16.19%
VALA total benefit	R 940 796 956	R 940 796 956	R 940 796 956	R 940 796 956
PI total benefit	R 1 469 995 244	R 1 469 995 244	R 1 469 995 244	R 1 469 995 244
VALA+PI benefit	R 2 410 792 200	R 2 410 792 200	R 2 410 792 200	R 2 410 792 200
Total CKD duties payable	R 3 247 989 491	R 3 919 987 317	R 5 655 981 700	R 6 159 980 069
Net position	R -837 197 291	R -1 509 195 117	R -3 245 189 500	R -3 749 187 869
Benefit differences vs ICE	R -	R -671 997 826	R -2 407 992 209	R -2 911 990 578
EXPORT MARKET PRODUCTION	**ICE - APDP 2021**	**HEV**	**PHEV**	**BEV**
VALA benefits – per export unit	R 12 621	R 12 621	R 12 621	R 12 621
PI benefits – per export unit	R 19 721	R 19 721	R 19 721	R 19 721
Total PI+VALA benefit – per unit	R 32 342	R 32 342	R 32 342	R 32 342
VALA total benefit	R 3 556 797 055	R 3 556 797 055	R 3 556 797 055	R 3 556 797 055
PI total benefit	R 5 557 495 399	R 5 557 495 399	R 5 557 495 399	R 5 557 495 399
VALA+PI benefit	R 9 114 292 454	R 9 114 292 454	R 9 114 292 454	R 9 114 292 454
Total CKD duties payable	R -	R -	R -	R -
Net position	R 9 114 292 454	R 9 114 292 454	R 9 114 292 454	R 9 114 292 454
Benefit differences vs ICE	R -	R -	R -	R -
OEMS NET POSITION	**ICE - APDP 2021**	**HEV**	**PHEV**	**BEV**
VALA – all production	R 4 497 594 011	R 4 497 594 011	R 4 497 594 011	R 4 497 594 011
PI – all production	R 7 027 490 642	R 7 027 490 642	R 7 027 490 642	R 7 027 490 642
VALA+PI – all production	R 11 525 084 654	R 11 525 084 654	R 11 525 084 654	R 11 525 084 654
CKD duties	R 3 247 989 491	R 3 919 987 317	R 5 655 981 700	R 6 159 980 069
VALA+PI – net position	R 8 277 095 163	R 7 605 097 337	R 5 869 102 954	R 5 365 104 584
Benefit differences vs ICE	R -	R -671 997 826	R -2 407 992 209	R -2 911 990 578
Percent decline in support vs. ICE	0.00%	8.12%	29.09%	35.18%

Source: Authors. *Note:* The benefits calculated in this table are derived from the value of production (VOP) of an average vehicle manufactured in South Africa for the domestic and export markets (multiplied by the number of vehicles manufactured for each market), as per the quarterly duty accounts of the seven domestic light vehicle OEMs.

Table 8 assumes no change in local content at South African assembly plants, which may not be the case. While securing NEV component investments will be difficult given South Africa's marginal position within the automotive GVC, existing APDP benefits would generously support any NEV components that are localised. This is demonstrated in Table 9, which reveals the extent of the APDP benefits that would be realised for any core electrical components that were localised. Assuming the full localisation of core electrical components (assuming 70% imported sub-components and 30% local content), the benefit an OEM would receive on an assumed R250 000 value of electrical components is a substantial R15 375, or 6.15% of the total value of the components and 20.5% of local content.

Table 9: Indicative APDP benefits for core electrical components in 2021*

BEV COMPONENTS	UNIT PRICE	LOCAL CONTENT @30%	VALA	PI	OEM INCENTIVE PER UNIT
Battery pack	R200 000	R60 000	R4 800	R7 500	R12 300
Battery management system	R6 000	R1 800	R144	R225	R369
Power controller	R20 000	R6 000	R480	R750	R1 230
Charger	R24 000	R7 200	R576	R900	R1 476
Total: Selected components	**R250 000**	**R75 000**	**R6 000**	**R9 375**	**R15 375**
Incentive as a % of unit price					**6.15%**
Incentive as a % of local content					**20.50%**

Source: Derived from OEM engagements. *Based on 2021 APDP benefits.

A major weakness within the existing APDP architecture is the potentially substantial NEV investments that need to be made by multinational OEMs in South Africa. While many aspects of NEV vehicle assembly are either identical or similar to ICE vehicle assembly, NEV model introductions are likely to require substantially larger investment levels, especially in key electric component technologies. There appear to be legitimate concerns that the local operating environment's deteriorating competitiveness over the past decade threatens the business case for these potentially larger investments in new technologies. While the AIS may be a sufficiently generous investment support measure for brownfield ICE vehicle model replacements, it is likely to be insufficient to cover the high cost and risks associated with NEV investment through the domestic automotive value chain, particularly when competitor economies are offering multinationals increasingly generous investment support to encourage NEV investments. These two weaknesses are explored in more detail below.

4.3. CKD duty exposure on high-value electric components

Local vehicle assemblers operate in a highly competitive domestic market. Their advantage in the local market is derived from a CBU import tariff ranging from 25% (when vehicles are sourced from outside of the EMA), down to 18% (when sourced from the EU or UK) (SARS,2021). Local OEMs are, however, themselves subjected to CKD duties of 20% for OEM components in Chapter 98 of Schedule 1 (SARS, 2021). This results in a much lower rate of actual protection in the domestic market. As explored in Table 8, the actual advantage for OEMs in the domestic market is 22% when competing with MFN-sourced CBU imports and only 15% when these vehicles are sourced from the EU or UK.[9] The data presented in Table 8 is based on the profile of an average vehicle produced in South Africa in 2021. The vehicle has 42% local content, with the balance imported, hence the substantial level of CKD duty exposure.

The CKD duty rate is fully rebated when South African assembled vehicles are exported, so the CKD duty rate is only an issue for locally assembled vehicles destined for the local market. The problem that emerges when the NEV transition is factored in, ultimately to BEVs, is that electric components are expensive, and therefore constitute a much larger portion of the value of fully assembled vehicles. In the short term, at least these high-value electrical components are likely to be fully imported. Modelling the impact of the NEV transition on the competitiveness of locally assembled vehicles for the domestic market, holding all local and imported values equal, but adding the imported electric component costs that would result in the 12% HEV, 43% PHEV and 52% BEV price differential in the selling price of the vehicle, indicates a major deterioration in the attractiveness of local assembly for the local market relative to importing vehicles, especially from the EU or UK. This is clearly demonstrated in Table 10, which shows that the 15%-22% advantage for an average ICE vehicle would deteriorate to 13.2%-20.2% for HEVs, 9.9%-16.9% for PHEVs and only 9.2%-16.2% for BEVs. The underlying reason for this perverse effect on APDP benefits is the decline in local content as a proportion of total value that occurs as NEVs are introduced. Holding local content constant in Rand value terms, imported content would decrease from 42% for ICE vehicles to as low as 27.6% for BEVs.

[9] This is after factoring in VALA and PI benefits for local assembly, which reduce the CKD duty payments of OEMs. Without these benefits and based on the 42% average local content level of vehicles manufactured locally for the South African market, the actual level of protection for domestic OEMs in the local market would only be 16.6% (outside of the EMA) and 9.6% (for vehicles sourced from the EMA).

Table 10: NEV CKD duty consequences on effective rate of CBU protection in the domestic market* (imports versus local assembly)

CBU	MFN	EMA	REDUCTION IN CBU PROTECTION VERSUS ICE
Internal Combustion Engine Vehicle	22.0%	15.0%	-
Hybrid Electric Vehicle	20.2%	13.2%	1.8%
Plug in Hybrid Electric Vehicle	16.9%	9.9%	5.1%
Battery Electric Vehicle	16.2%	9.2%	5.8%

* Based on an ICE vehicle with 42% local content, and then adjusting imported content per the increased cost of NEV components. On this basis, local content drops to 37.5% for HEVs, 29.4% for PHEVs and 27.6% for BEVs.

The narrow advantage for local OEMs in the domestic market exists even after applying VALA and PI benefits, which are significant. As highlighted in Table 8, the increase in CKD duties would eliminate up to R2.9 billion in APDP benefits for South Africa's seven light vehicle OEMs, or a full 35.2% of the assembly benefits presently secured from the programme. The level of impact is variable from one OEM to the next, but all OEMs would be affected, especially those with significant domestic market sales. As presented in Table 10, a domestic market advantage as low as 9.2% would clearly threaten local assembly, especially in the short term. And yet there appears to be little the domestic OEMs can do to ameliorate their duty position. The largest electric component cost is the battery pack, which is unlikely to be localised in the foreseeable future. Other electric components may represent opportunities, but any short-to-medium-term opportunity appears to be an assembly-based, as opposed to securing high-value electrical component manufacturing in South Africa.

Reducing the CKD duty exposure of local assemblers for a period is therefore a critical consideration for the South African government. Applying a 50% CKD duty rebate on NEV components for a defined period (perhaps to 2030) would allow the local assemblers to compete more effectively in the emerging domestic NEV market, while still maintaining pressure on them to localise the assembly of electric components and, when possible, even their local manufacture. The annual benefit to local OEMs of introducing a 50% CKD rebate on electric components is presented in Table 11. This shows that, while it would not fully compensate OEMs for their higher CKD costs, it would ensure more substantial market protection, thereby encouraging local assembly, and maintaining higher levels of APDP benefit for the OEMs.

Table 11: Correcting the CKD duty consequences of the NEV transition, based on the application of a 50% rebate on NEV CKD components

INDUSTRY NET POSITION	ICE	HEV	PHEV	BEV
Total CKD duties payable	R 3 247 989 491	R 3 919 987 317	R 5 655 981 700	R 6 159 980 069
Of which NEV powertrain CKD duties	R -	R 671 997 826	R 2 407 992 209	R 2 911 990 578
NEV powertrain rebate @50%	R -	R 335 998 913	R 1 203 996 104	R 1 455 995 289
Total CKD position post rebate	R 3 247 989 491	R 3 583 988 404	R 4 451 985 595	R 4 703 984 780
Add back VALA+PI	R 9 114 292 454	R 9 114 292 454	R 9 114 292 454	R 9 114 292 454
Net position	R 5 866 302 963	R 5 530 304 050	R 4 662 306 858	R 4 410 307 674

Source: Authors.

4.4. AIS augmentation to support NEV-related investments

The AIS has provided the South African automotive industry with significant investment support since establishing the APDP. Component manufacturers receive up to 35% of their investment back in the form of cash grants paid over a three-year period, while OEMs qualify for support of up to 30%, which is paid on the same terms. These levels of support are generous by global ICE vehicle standards, although several stakeholders expressed immense frustration with the AIS's qualifying requirements,

especially those pertaining to BBBEE and the maintenance of employment levels within plants because of the investment. Certain key firms argued that these qualifying requirements undermined the AIS and the business case for investment in South Africa, especially when introducing new technologies that are tightly controlled under global lead source contracts (and therefore not open to joint venture or equity transfer considerations) and that may generate less direct employment than the technologies they replace.

Under existing interpretations of the AIS regulations, the view from key firms is that many major NEV investments would not qualify for support, and hence are not being considered. It was further argued that the 35% and 30% maximum support thresholds under the existing AIS may be insufficient to secure major NEV investments in any case. Economies with major automotive industries are competing aggressively with each other and rolling out generous incentives to secure NEV investments. As documented in the Key Findings Report, these range from providing cash grants to tax holidays of up to eight years, to infrastructure, logistics and employment subsidies. If the South African government is determined to support domestic OEMs to secure local NEV investments, increasing the AIS to 50% for NEV-specific investments may make the country more attractive as an investment location. Given the lack of clarity of where emerging NEV technologies will be positioned within the automotive GVC, distinguishing between OEM and component manufacturer investments also appears redundant. The provision of 50% AIS support for NEV investments, irrespective of their position in the value chain, appears the most sensible approach. Given the automotive industry's investment trajectory over the past few years[10] and based on the industry's envisaged growth trajectory to 2035, the amount of investment required to drive an NEV transition is outlined in Table 12.

The NEV investment presented in Table 12 is calculated on the actual levels of investment made in the South African automotive industry over the 2014 to 2020 period provided in Appendix C (US$756 million annually, with no average annual change over time, with US$545 million comprising annual OEM investments and US$213 million comprising annual component manufacturing investments), adjusted by an additional 30%. This adjustment is based on the higher projected cost of NEV productive assets, the need for specific NEV infrastructure, and the associated development of NEV skills. This will take total annual projected investments in the industry to US$985 million annually (US$708 million at OEMs and US$276 million at component manufacturers) for the period to 2035. This level of investment, if entirely NEV-based, would generate the need for AIS incentives equating to US$492 million annually (US$295 million for existing levels of AIS support, and a further US$197 million based on the proposed additional 20% of NEV investment support).

Table 12 details how the successful shift to NEV production in the South African automotive assembly and components industry would result in significantly more overall capital investment (R343 billion by 2035), but that this would simultaneously require significantly more government support. Based on the projection model, and the proposed additional 20% in NEV incentives, the AIS would need to increase its support for the industry from R103 billion for the period, to R171 billion (a further R68 billion).[11]

[10] Appendix C provides an overview of automotive investment levels in South Africa from 2014 to 2020.

[11] These figures are projected Rand expenditure levels tied to the value of investments in United Stated Dollars. The Rand is projected to depreciate at 3% per annum, with this reflected in the growing annual Rand capital expenditure, but stable United States Dollar investment level.

Table 12: Potential NEV investment profile to 2035, and associated AIS implications (all figures in millions)

YEAR	ASSEMBLY	COMPONENTS	TOTAL INVESTMENT	AIS BASE @ 30% INCENTIVE (RANDS)	AIS BASE INCENTIVE (US$)	ADDITIONAL 20% NEV INCENTIVE	TOTAL ADDITIONAL NEV SUPPORT REQUIRED (US$)
2021	R 9 631	R 3 759	R 15 411	R 4 623	US$ 295	R 3 082	US$ 197
2022	R 10 208	R 3 985	R 16 215	R 4 865	US$ 295	R 3 243	US$ 197
2023	R 10 820	R 4 224	R 17 067	R 5 120	US$ 295	R 3 413	US$ 197
2024	R 11 469	R 4 477	R 17 970	R 5 391	US$ 295	R 3 594	US$ 197
2025	R 12 156	R 4 745	R 18 927	R 5 678	US$ 295	R 3 785	US$ 197
2026	R 12 885	R 5 030	R 19 941	R 5 982	US$ 295	R 3 988	US$ 197
2027	R 13 658	R 5 331	R 21 016	R 6 305	US$ 295	R 4 203	US$ 197
2028	R 14 476	R 5 651	R 22 155	R 6 647	US$ 295	R 4 431	US$ 197
2029	R 15 344	R 5 990	R 23 363	R 7 009	US$ 295	R 4 673	US$ 197
2030	R 16 264	R 6 349	R 24 643	R 7 393	US$ 295	R 4 929	US$ 197
2031	R 17 239	R 6 729	R 25 999	R 7 800	US$ 295	R 5 200	US$ 197
2032	R 18 273	R 7 133	R 27 437	R 8 231	US$ 295	R 5 487	US$ 197
2033	R 19 368	R 7 560	R 28 961	R 8 688	US$ 295	R 5 792	US$ 197
2034	R 20 529	R 8 013	R 30 576	R 9 173	US$ 295	R 6 115	US$ 197
2035	R 21 760	R 8 494	R 32 288	R 9 687	US$ 295	R 6 458	US$ 197
TOTAL	R 224 081	R 87 468	R 341 969	R 102 591	US$ 4 432	R 68 394	US$ 2 954

5. POLICY RECOMMENDATIONS

The analysis of NEV developments in major developed economies, the review of policy responses across a range of international comparator economies, comprehensive engagements with South African automotive industry stakeholders, and in-depth modelling of potential South African market developments to 2035, has led the project team to develop several key NEV policy recommendations for **the dtic** to consider. These recommendations are made explicit in this section of the report and represent the key value added of the project. Key is determining appropriate policy levers to support the transition of the domestic market to 20% NEV consumption in 2025, 40% in 2030 and 60% in 2035, while simultaneously not increasing the cost of vehicles in the beleaguered domestic market and supporting the continued development of the local automotive value chain, in alignment with the objectives of the SAAM. As highlighted in this section, the project team believes this is possible, provided an integrated and mutually supporting set of demand- and supply-side incentives are introduced, in conjunction with the established support measures being provided to the automotive industry at present through **the dtic's** successful APDP.

5.1. NEV subsidy for new vehicle purchases

It is recommended that the South African government introduce a purchase incentive for the consumption of new NEVs in the domestic market. This incentive sits at the heart of the suite of proposals and is central to driving a just transition in the vehicle market and associated domestic industry (as explored below). The incentive should be scaled according to the environmental benefits of the three tiers of NEV technology, with the lowest level of support provided to HEVs, intermediate support for PHEVs, and the highest levels of support for BEVs.

Based on the modelling completed, it is recommended that the incentive be set at R80 000 for BEVs, R40 000 for PHEVs and R20 000 for HEVs. This is highlighted in Table 13. These are the levels of support required to meaningfully support the transition to NEV consumption in the highly price-sensitive first two quintiles of the South African market, and to encourage NEV consumption in the more expensive, less price-sensitive market segments. Importantly, the proposed incentives will not fully equilibrate the pricing of NEVs and ICE vehicles in the domestic market. They will rather narrow the pricing gap, with the objective of securing price differentials of no more than 10% in large volume domestic market segments, which is the price premium that automotive stakeholders reported is acceptable for NEVs to remain competitive to ICE vehicles.

Table 13: NEV purchasing incentive summary

NEV-TYPE	PROPOSED SUPPORT	RATIONALE
HEV	R20 000	HEVs are the most competitive NEV, at least in the short term and especially in the South African operating context. Incentivising the consumption of more expensive HEVs will expedite the immediate transition to NEVs and prepare the domestic market for a more fundamental transformation. HEVs also do not need enhancements to the country's electricity grid and will immediately reduce the industry's carbon footprint.
PHEV	R40 000	PHEVs represent a relatively expensive transition technology for light vehicles (hence the higher level of incentive proposed) but may hold an important market position for LCVs over a longer period, especially given South Africa's distinctive LCV use profile. PHEVs also represent a compromise technology in preparation for the conversion of the country's energy supply to renewable technologies.
BEV	R80 000	BEVs will ultimately dominate the South African light vehicle market, but the base cost competitiveness of the technology is unlikely to reach parity with ICE technologies over the next decade, hence the need for a substantial purchasing incentive. Reducing the carbon footprint of the South African automotive industry requires the conversion of the country's energy supply to renewable technologies.

It is important to emphasise that the NEV transition model presented for the South African market in Figure 3 clearly depicts a major continued role for ICE vehicles in the domestic market through to 2035, with NEV sales only occupying a majority position in the market by 2033. Consumers will still have access to ICE vehicle equivalents over the duration of the SAAM period, thereby limiting the potential damage to the market of only having more expensive products available.

Subject to periodic reviews, it is further recommended that the NEV grant remain unchanged over the SAAM period. Battery electric technology costs are presently declining at about 3% per annum, which is roughly the comparative annual depreciation value of the South African Rand. By holding the incentive constant at the recommended values, the real value of the incentive will decline in alignment with the Rand's depreciation. This will reduce the fiscal cost of the incentive when measured on a Net Present Value (NPV) basis, and will also more aggressively incentivise early NEV adoption, which is key to the successful transition to NEV consumption in the domestic market.

The cost of introducing the NEV grant will be very substantial if it is successfully taken up by consumers. As highlighted in Table 14, the modelled cost will be reasonable over the initial period, at R7.6 billion for the four years from 2022 to 2025 (measured in 2021 constant Rand values). However, these costs will then escalate significantly as PHEV and BEV consumption increases and the growth in HEV sales abates (as per Figure 3). The total cost will reach R31.9 billion by the end of 2030, and R94.5 billion by 2035. The figures in Table 14 further show that we recommend HEVs only receiving support for the period to the end of 2030. Beyond this period, only PHEVs and BEVs should receive NEV support, with HEVs deemed ICE variants from 2031 onwards. This is consistent with the NEV policies in the EMA.

Table 14: The fiscal cost of incentivising NEV purchases, based on forecasted market growth, a phased NEV transition, and recommended incentivisation levels to achieve 60% NEV market share in 2035

Year	HEV	PHEV	BEV	Total incentive	Incentive in NPV
2022	R 257 094 000	R 171 396 000	R 342 792 000	R 771 282 000	R 771 282 000
2023	R 443 487 150	R 354 789 720	R 709 579 440	R 1 507 856 310	R 1 436 053 629
2024	R 642 612 880	R 550 811 040	R 1 101 622 081	R 2 295 046 001	R 2 086 405 456
2025	R 950 149 045	R 950 149 045	R 1 900 298 089	R 3 800 596 178	R 3 304 866 242
A. Total incentive to secure 20% NEV market share in 2025				R 8 374 780 489	R 7 598 607 326
2026	R 983 404 261	R 1 180 085 113	R 2 753 531 931	R 4 917 021 305	R 4 097 517 754
2027	R 1 017 823 410	R 1 424 952 774	R 4 071 293 641	R 6 514 069 825	R 5 211 255 860
2028	R 1 053 447 230	R 1 685 515 567	R 5 477 925 594	R 8 216 888 391	R 6 320 683 377
2029	R 1 090 317 883	R 1 962 572 189	R 6 978 034 449	R 10 030 924 520	R 7 430 314 459
2030	R 1 128 479 008	R 2 256 958 017	R 9 027 832 068	R 12 413 269 093	R 8 866 620 781
B. Total incentive to shift NEV market share to 40% in 2030				R 42 092 173 135	R 31 926 392 232
2031	R -	R 2 803 141 857	R 10 278 186 809	R 13 081 328 666	R 9 021 605 977
2032	R -	R 3 384 793 792	R 11 605 007 288	R 14 989 801 081	R 9 993 200 721
2033	R -	R 4 003 727 515	R 13 012 114 422	R 17 015 841 937	R 10 977 962 540
2034	R -	R 4 661 840 225	14 503 502 921	R 19 165 343 146	R 11 978 339 466
2035	R -	R 5 361 116 258	16 083 348 775	R 21 444 465 034	R 12 996 645 475
TOTAL	**R 7 566 814 867**	**R 30 751 849 113**	**R 97 845 069 508**	**R 136 163 733 488**	**R 94 492 753 737**

The first qualifying element to this recommendation is that the purchase incentive is only made available to HEVs, where it is demonstrated that the HEV model receiving the incentive can run for a distance exclusively on its battery. HEVs with small supplementary batteries that improve fuel efficiency but that are incapable of autonomously propelling a vehicle must be considered ICE vehicles and hence excluded from the incentive.

The final key qualification criterion is that purchasing incentives are provided only to HEVs, PHEVs and BEVs that meet EMA homologation requirements. There is a growing share of low-value, low-battery capacity NEVs in certain Asian markets that would not be appropriate for the South African market, and it is important that these low-technology, limited-capability products are not inadvertently incentivised. Given market fragmentation challenges, it would be a substantial advantage to the local automotive industry if the emerging NEV market were homologated to EMA standards only, thereby ensuring the potential for larger volumes of demand across specific model platforms.

The proposed funding modality for the NEV purchasing incentive is to link it to the ad valorem tax payments of the local OEMs and importers, and to pay the incentive to the OEMs after vehicle sales are registered, with the incentive then accumulating as a rebate that they can use to settle their ad valorem excise payments partly or fully. This will incentivise the OEMs and the vehicle importers to best balance their NEV and ICE vehicle portfolios (local production and imports) for the domestic market.

5.2. Align SADC-EU EPA tariffs with ICE

Duty-free access to the EMA has been key to developing the South African automotive value chain, with the business case for the domestic assembly of most vehicle models predicated on access to the South African and EMA markets. At the same time, preferential EMA access to the South African market has supported the competitiveness of EMA-sourced products in the price-sensitive domestic market. The growing proportion of local production destined for the EMA market is strongly indicative of that market's importance to the local automotive industry. Maintaining preferential access to the EMA as the automotive industry undergoes its NEV transition is therefore critical to the South African automotive industry, as is access to competitive NEV product supply from that market.

And yet, BEVs are excluded from the SADC-EU EPA, and by implication the extension of the agreement to the UK. It is therefore imperative that this is corrected as soon as possible. It is recommended that NEVs be included in the EPA on the same basis as the existing agreement, so EMA-sourced NEV products have a 7% advantage in the South African market, and South African-sourced NEV products to have duty-free access to the EU and UK markets.

One further anomaly that needs to be corrected is the duty-free importation of sub-1 000cc EMA-sourced vehicles into the South African market. This has already caused major damage to the South African automotive industry and is likely to be a common occurrence in future PHEV sales. As battery packs become more efficient, the expectation is that that ICEs will miniaturise and that future PHEVs may have sub-1 000cc engines, even on large vehicles. Closing the sub-1 000cc technical loophole in the EPA is critical to the integrity of the inclusion of NEVs.

5.3. CKD duty rebate on electrical components

To ensure the competitiveness of locally assembled NEVs in the domestic market, it is recommended that **the dtic** introduce a CKD duty rebate equal to 50% of the value of NEV components included as CKD imports. As was highlighted in Table 11, the economics of NEV production will negatively impact the short-term competitiveness of local assemblers producing NEV products for the domestic market. Modelling shows market protection for locally assembled vehicles declining to as low as 9.2% for EMA-sourced light vehicles, and the seven local OEMs losing R2.9 billion in annual benefits from the APDP because of the shift. The provision of the 50% rebate will not completely ameliorate these APDP incentive losses but will upwardly adjust the effective CBU rate of protection in the domestic market, and significantly reduce the incentive losses incurred (to R1.45 billion).

One of the key reasons for the negative NEV impact is the continued low level of local content in South African assembled vehicles. Data for 2020 reveals local content levels of around only 42% for locally

assembled vehicles supplied into the domestic market and 38% for exported vehicles, hence the sensitivity of the local OEMs to CKD duties. When import levels climb to as much as 74.5% of the value of locally assembled vehicles because of the inclusion of expensive electric components in their CKD packs, the business case for operating in South Africa is clearly compromised. The medium-term solution to this challenge is the localisation of expensive electric components, but this is unlikely in the short term as core electrical technology is likely to remain locked in Tier 1 automotive economies for at least one model generation.[12] The localisation of electrical technology is moreover likely to occur in two phases, with the first phase involving the assembly of imported core electrical technology (for example, the assembly of battery packs using imported batteries and battery management systems), and the second phase the upstream manufacturing of core NEV component technologies.

In alignment with this projected phasing, the project team propose that the 50% rebate of CKD duties on electrical components be implemented in two phases. In phase 1, to run until the end of 2025, it is proposed that the 50% rebate of all NEV CKD electrical components (see Table 6) on an unconditional basis. Essentially, electrical components can be imported as full sub-assemblies, and qualify for the 50% rebate. However, from 1 January 2026 to the end of 2030, it is proposed that the 50% rebate is adjusted to include only NEV components that are imported for sub-assembly in South Africa. As examples, batteries will qualify for the 50% rebate only if they are assembled into battery packs in South Africa. This phasing will force the opening of the bill of materials on key NEV sub-assemblies, while simultaneously supporting NEV assembly in South Africa. It is moreover recommended that the 50% rebate is time-bound, and so terminated at the end of 2030. As the domestic market transitions to greater volumes of NEV consumption and the various NEV technologies mature, localisation opportunities will increasingly emerge. It is also important that domestic OEMs remain incentivised to deepen their local supply chains – for their own long-term benefit and the country.

5.4. Increased AIS for NEVs

To secure the future of NEV production in South Africa, it is recommended that **the dtic** increase the AIS from 30%/35% to 50% for NEV-specific investments (making no distinction between OEMs and component firms for NEV investments). The cost of this adjustment is significant, as highlighted in Table 12. However, it is deemed critical to securing NEV investment, especially in respect of entirely new NEV models and their electrical components that ideally need to be localised. The 50% AIS should therefore be focused on supporting investments across all NEV types and the range NEV components included in Table 6.

It is further recognised that new NEV technologies and associated components may emerge over the next few years. As such, the qualifying list should remain open for the potential inclusion of additional NEV components. It is also recommended that **the dtic** review the AIS qualifying requirements for NEV investments. Neither the equity-based requirements of the BBBEE scorecard, nor the employment maintenance requirements, are likely to support crucial NEV investments and will potentially undermine the benefits of offering higher levels of support.

5.5. Summary of recommendations

The project team's recommendations are summarised in Table 15. The table also outlines the underlying rationale and supportive conditions required to optimally support the recommendations. Critically, the project team believes that, in combination, the recommendations will support the realisation of the national government's objective of transforming the South African automotive market from an ICE-based market to a NEV-dominated market within the period of the SAAM. In

[12] OEMs and their core technology partners typically develop their latest technology products in their home markets, and iterate and develop them locally, before rolling them out to subsidiary operations.

addition to supporting the fundamental transformation of the South African vehicle market, the recommendations should also support the continued development of the domestic automotive value chain as it strategically repositions itself in relation to emerging NEV trends. It is only through the balancing of both demand- and supply-side considerations that the future of the South African automotive industry can be secured as it navigates the complex one-in-a-hundred-year transition it is presently going through, hence the recommendations made.

Table 15: Recommendations to support the South African automotive industry's NEV transiton to 2035

RECOMMENDATIONS	RECOMMENDED LEVEL OF SUPPORT	CONDITIONS	INDUSTRY BENEFITS	FISCAL COST*
1. Introduce NEV purchasing subsidy	• R20 000 incentive for the purchase of HEVs (to 31 December 2030); R40 000 for PHEVs, and R80 000 for BEVs (to 31 December 2035) to drive increased NEV consumption • Incentives to be reviewed periodically and adjusted based on NEV cost competitiveness changes over time (relative to ICE vehicles)	• HEVs only supported if vehicle can be driven only in full electric mode • Incentives only available for EMA homologated NEVs	• Closure of price gap between NEVs and ICE vehicles in South African market • 20% of South African market comprising NEV sales in 2025, 40% in 2030 and 60% in 2035 • South African market alignment with EMA market developments	• R7.6 billion to 2025, R31.9 billion to 2030, and R94.5 billion to 2035
2. Align NEV EMA EPA tariffs	• South African-based OEMs to secure long-term duty-free access to the EMA (EU and UK) market to secure existing South Africn vehicle production models • NEV models produced in the EMA to be available in South Africa at competitive pricing levels (through the reduction of BEV tariffs from 25% to 18%), as per the existing EPA	• EMA tariff reduction to be reciprocal • PHEVs with sub-1 000cc ICEs from the EMA to incur 18% CBU duty, per the balance of NEVs and ICE vehicles	• Continued access of South African OEMs to the EMA • Cost competitive EMA vehicles in the SA market	• None, will maintain the industry's status quo in respect of two-way trade flow between the EMA and South Africa
3. Provide 50% CKD rebate on NEV electrical components	• South African-based OEMs to be protected from the adverse impact of	• No conditions on NEV CKD components to	• Reduction in CKD duty costs for OEMs	• None. Rebate worth R1.5 billion to

RECOMMENDATIONS	RECOMMENDED LEVEL OF SUPPORT	CONDITIONS	INDUSTRY BENEFITS	FISCAL COST*
	20% CKD duties on expensive NEV components, as they transition to NEV vehicle assembly	31 December 2025 • NEV module assembly requirements from 2026 to 31 December 2030, then full removal of rebate	assembling NEVs	OEMs annually, but in face of R2.9 billion in additional costs if no local sourcing of NEV components
4. Increase AIS support for NEV investment	• Increase maximum AIS from 30% (OEMs) or 35% (component manufacturers) to 50% for NEV investments	• All NEV components to qualify • Remove the AIS BBBEE and employment conditions on NEV investments	• Automotive industry investments to increase by up to 30% annually	• Additional AIS support of up to R68.4 billion to 2035
5. Maintain balance of APDP incentives	• Maintenance of existing levels of APDP support	• APDP to be reviewed in 2025, to consider policy amendment post 2026 • All recommendations included in this report to be reviewed as part of overall APDP review	• VALA and PI provide major localisation incentive for OEMs • PI provides major incentive for aftermarket and export focused component firms	• No change on base APDP benefits

Source: Authors. *This represents the maximum fiscal cost if the incentives were successful in driving the targeted levels of NEV change to 2035.

Importantly, while the recommendations summarised in Table 15 represent the project team's primary recommendations, and are likely to sit at the heart of a successful transition to NEV consumption and production in South Africa, there are a range of other potential interventions and conditions that would further support the necessary transition advocated in this report. The provision of in-use benefits to NEVs, such as vehicle road tax reductions, parking or toll road discounts, or exclusive road access in highly polluted urban areas, are all mechanisms that would support the NEV transition, and ultimately the effectiveness of the core incentives proposed in this report. Similarly, the recommendations given have a set of associated conditionalities that are non-marginal to their effective implementation. For example, establishing South Africa's in-country homologation and certification capabilities in respect of NEVs is key, as is the ability of **the dtic** to screen the inclusion of NEV components in the suite of proposed incentives.

6. CONCLUSION

As set out in the introduction to this report, the NEV challenge in South Africa is two dimensional, encompassing both demand- and supply-side considerations, hence the focus of the recommendations made. It is imperative that the domestic market grows and increasingly sells NEVs, broadly in alignment with leading global markets. However, it is similarly important that the South African automotive value chain continues to develop in alignment with the objectives of the SAAM. The automotive industry has the potential to catalyse South Africa's industrial development, hence the ambitious targets set in the SAAM. While these may not be fully achievable, given the impact of COVID-19 and the poor performance of the South African economy over the past few years, the SAAM and its aspirational targets should remain critical guiding frameworks to drive decision-making in the automotive policy space.

The recommendations, as presented in this report, have the potential to:

- Support South Africa's continued market development, ensuring sales do not decline because of higher NEV costs.
- Support the successful transition of the South African light vehicle market from an ICE vehicle dominated market, to a low carbon emitting market dominated by NEV consumption.
- Secure South African production access to the EMA as the key EU and UK markets transition to NEV consumption only.
- Support the competitiveness of domestic vehicle assemblers and their local supply chains in the South African NEV market by reducing the duty burden on expensive imported NEV components.
- Attract NEV investment through the South African automotive value chain, in preparation for the removal of NEV CKD duty rebates in 2030.
- Incentive NEV assembly and component production in South Africa, thereby positioning the industry for future growth and development.

In effect, the recommendations in this report endeavour to resolve a "wicked problem" that is inherently complex. As set out in the brief for the project, the recommendations set out how South Africa can transition both its market and its production to NEVs, while simultaneously achieving the objectives set within the SAAM. As outlined, the only way to do this is by providing extensive incentives, as per the documented findings for all the leading global vehicle markets and automotive producing economies covered in the project's Key Findings Report (see Barnes et al, 2021).

While a range of alternative recommendations could be considered, and/or only a selection of the recommendations presented in Table 15 implemented, an optimal demand- and supply-side outcome for the South African automotive industry is likely only through the co-ordinated implementation of the five recommendations that have been made.

For example, it is possible to support the NEV transition in South Africa simply by significantly raising the carbon tax and making ICE vehicles more expensive than their NEV counterparts. The direct consequence would, however, be a substantially smaller domestic market for light vehicles, significantly reduced government revenue from the industry; and an equivalent decline in the scale of domestic vehicle production. The consequences for the South African automotive industry would be severe: it would significantly reduce its contribution to domestic gross domestic product (GDP), and the country would lose many thousands of jobs. South Africa would, however, have a domestic vehicle market dominated by, or even entirely made up of, NEVs. Its vehicle fleet would potentially be aligned with the international NEV frontier, albeit at huge cost to the South African economy.

Conversely, the government could also follow the route of not encouraging NEV consumption at all. Essentially, it could do nothing and simply allow ICE vehicle sales to dominate in the domestic market until the economics of NEV production are sufficiently compelling to compete against ICE vehicles. This will happen sometime in the future. A deliberate "do nothing" approach would likely maintain the existing demand profile of the South African market and thereby maintain the government's very significant fiscal take from vehicle sales. Negatively, the domestic vehicle fleet would remain highly polluting, and the domestic market would likely be increasingly dislocated from the incentive-induced cleaner energy markets of the developed economies. This could threaten local production, as South African-based OEMs would lose the ability to supply locally produced models into both domestic and developed international markets. While the South African market may continue unaffected, there may be significant lost local production, including the potential withdrawal of NEV-focused OEMs from South Africa. While NEV domestic demand could be supplied from import sources, balance of trade and payment issues may soon become major economic challenges, as is presently the case in other Sub-Saharan African economies.

The government could choose to not interfere on the demand-side of the automotive equation and only support supply-side interventions. The APDP is already an effective and generous technology agnostic incentive package, which compensates OEMs and component manufacturers for "South African" costs. The APDP could be further bolstered through the provision of the proposed NEV components CKD rebate and the additional AIS for NEV investments. In combination, these two supply-side incentives would mitigate some of the negatives associated with a "do nothing" approach and align NEV supply-side and demand-side opportunities in future.

One recommendation that has no cost implications (other than customs duties) and which could be implemented irrespective of any other recommendations, is the inclusion of NEVs within the SADC-EU EPA. This represents a key opportunity to align future local NEV production with EMA demand shifts and is potentially key to the future of the South African automotive industry, irrespective of the timing of the switch to NEVs in the domestic market.

REFERENCES

Barnes, J., Montmasson-Clair, G., Moshikaro, L. and Ndlovu, M, 2021. South African New Energy Vehicle Research Report. Report compiled for the Department of Trade, Industry and Competition, Government of South Africa. December 2021.

Barnes, J. and Grant, C. 2019. Reducing Ad Valorem taxation on vehicles to stimulate domestic market sales in a fiscally neutral manner. Report compiled for the National Association of Automobile Manufacturers of South Africa. May 2019.

the dtic, 2021. Auto Green Paper on the Advancement of New Energy Vehicles in South Africa. The Government Gazette. 21 May 2021. No. 44606 3. Notice 308 of 2021.

Department of Transport. 2018. Green Transport Strategy for South Africa (2018-2050). Department of Transport. Republic of South Africa.

SARS. 2021. Customs & Excise Tariff. Schedule 1 / Part 1. South African Revenue Service. 2021-09-17.

APPENDIX A

Table 16: Subsidies required to equilibrate NEV sales with ICE sales for locally assembled vehicles in the South African market

	LOCALLY ASSEMBLED VEHICLES				
	QUINTILE 1	QUINTILE 2	QUINTILE 3	QUINTILE 4	QUINTILE 5
Price required to maintain demand	R185 380	R261 744	R366 397	R489 082	R654 058
Subsidy per HEV	R21 159	R32 923	R44 494	R58 523	R85 809
Subsidy per PHEV	R75 323	R112 686	R152 497	R202 160	R281 296
Subsidy per BEV	R88 077	R134 028	R178 511	R236 870	R330 883
Total sales	R7 236 954 930	R15 294 735 154	R13 957 825 640	R34 413 457 577	R10 377 285 002
Total sales (ICE)	R2 371 600 440	R4 945 503 736	R4 550 939 280	R11 234 799 620	R3 358 457 542
Total sales (HEV)	R990 861 598	R2 087 833 156	R1 913 847 161	R4 717 174 731	R1 424 651 087
Total sales (PHEV)	R1 250 706 187	R2 652 991 752	R2 416 902 009	R5 954 496 373	R1 801 071 369
Total sales (BEV)	R2 623 786 704	R5 608 406 511	R5 076 137 191	R12 506 986 852	R3 793 105 004
Number of Vehicles	31 983	47 236	31 052	57 428	12 837
Number of ICE vehicles	12 793	18 894	12 421	22 971	5 135
Number of HEVs	4 797	7 085	4 658	8 614	1 926
Number of PHEVs	4 797	7 085	4 658	8 614	1 926
Number of BEVs	9 595	14 171	9 316	17 228	3 851
Total taxes and levies	R992 164 122	R2 303 970 276	R2 414 757 106	R6 399 836 034	R2 023 980 703
Total subsidies	R1 307 953 830	R1 981 336 460	R1 749 011 075	R4 286 014 959	R1 344 010 223
Total HEV subsidies	R101 511 433	R233 269 255	R207 244 931	R504 124 874	R165 229 509
Total PHEV subsidies	R361 356 022	R798 427 851	R710 299 779	R1 741 446 516	R541 649 791
Total BEV subsidies	R845 086 374	R949 639 354	R831 466 365	R2 040 443 569	R637 130 924
Government revenue	-R315 789 708	R322 633 815	R665 746 031	R2 113 821 075	R679 970 480
Impact of sales revenue vs 100% ICE	R1 307 953 830	R2 930 975 815	R2 580 477 440	R6 326 458 528	R1 981 141 147
Impact on government revenue vs 100% ICE	-R1 387 516 077	R1 786 586 267	R1 577 674 168	R3 861 552 497	R1 155 463 313

Table 17: Subsidies required to equilibrate NEV sales with ICE sales for imported vehicles in the South African market

	IMPORTED VEHICLES				
	QUINTILE 1	QUINTILE 2	QUINTILE 3	QUINTILE 4	QUINTILE 5
Price required to maintain demand	R170 049	R259 915	R354 734	R504 339	R970 921
Subsidy per HEV	R14 547	R26 419	R42 369	R72 261	R214 543
Subsidy per PHEV	R63 499	R102 662	R148 165	R226 728	R531 245
Subsidy per BEV	R75 521	R121 806	R175 004	R267 388	R618 302
Total sales	R13 170 896 880	R15 972 199 163	R17 838 350 679	R25 244 117 510	R38 387 011 783
Total sales (ICE)	R4 382 710 835	R5 257 967 200	R5 807 842 792	R8 091 209 326	R11 754 740 513
Total sales (HEV)	R1 784 111 252	R2 172 154 349	R2 438 074 431	R3 468 942 418	R5 382 065 045
Total sales (PHEV)	R2 257 229 930	R2 750 542 599	R3 087 622 659	R4 398 242 521	R6 819 906 666
Total sales (BEV)	R4 746 844 863	R5 791 535 015	R6 504 810 797	R9 285 723 245	R14 430 299 559
Number of Vehicles	64 433	50 574	40 931	40 108	30 267
Number of ICE vehicles	25 773	20 230	16 372	16 043	12 107
Number of HEVs	9 665	7 586	6 140	6 016	4 540
Number of PHEVs	9 665	7 586	6 140	6 016	4 540
Number of BEVs	19 330	15 172	12 279	12 032	9 080
Total taxes and levies	R2 478 546 229	R3 161 867 294	R3 726 298 665	R5 618 479 649	R10 248 410 687
Total subsidies	R1 484 213 925	R1 903 251 356	R2 244 279 348	R3 407 436 069	R6 193 038 413
Total HEV subsidies	R140 594 689	R200 416 649	R260 133 384	R434 738 920	R974 037 353
Total PHEV subsidies	R613 713 367	R778 804 899	R909 681 613	R1 364 039 024	R2 411 878 973
Total BEV subsidies	R729 905 869	R924 029 808	R1 074 464 352	R1 608 658 125	R2 807 122 087
Government revenue	R994 332 304	R1 258 615 939	R1 482 019 317	R2 211 043 580	R4 055 372 274
Impact of sales revenue vs 100% ICE	R2 214 119 793	R2 827 281 163	R3 318 743 700	R5 016 094 194	R9 000 160 500
Impact on government revenue vs 100% ICE	R1 401 641 956	R1 769 254 984	R2 059 344 385	R3 067 225 777	R5 403 211 587

Table 18: Subsidies required to equilibrate NEV sales with ICE sales in the South African market (locally assembled vehicles and imports)

	TOTAL VEHICLE SALES				
PRICE REQUIRED TO MAINTAIN DEMAND	**QUINTILE 1**	**QUINTILE 2**	**QUINTILE 3**	**QUINTILE 4**	**QUINTILE 5**
Subsidy per HEV	R175 135	R260 798	R359 765	R495 356	R876 554
Subsidy per PHEV	R17 853	R29 671	R43 432	R65 392	R150 176
Subsidy per BEV	R69 411	R107 674	R150 331	R214 444	R406 271
Total sales	R81 799	R127 917	R176 757	R252 129	R474 592
Total sales (ICE)	R20 407 851 810	R31 266 934 317	R31 796 176 319	R59 657 575 087	R48 764 296 785
Total sales (HEV)	R6 754 311 275	R10 203 470 936	R10 358 782 072	R19 326 008 946	R15 113 198 055
Total sales (PHEV)	R2 774 972 851	R4 259 987 505	R4 351 921 591	R8 186 117 149	R6 806 716 132
Total sales (BEV)	R3 507 936 117	R5 403 534 351	R5 504 524 669	R10 352 738 895	R8 620 978 035
Number of Vehicles	R7 370 631 568	R11 399 941 526	R11 580 947 988	R21 792 710 097	R18 223 404 562
Number of ICE vehicles	96 416	97 810	71 983	97 536	43 104
Number of HEVs	38 566	39 124	28 793	39 014	17 242
Number of PHEVs	14 462	14 672	10 797	14 630	6 466
Number of BEVs	14 462	14 672	10 797	14 630	6 466
Total taxes and levies	28 925	29 343	21 595	29 261	12 931
Total subsidies	R3 470 710 351	R5 465 837 570	R6 141 055 771	R12 018 315 683	R12 272 391 390
Total HEV subsidies	R2 792 167 754	R3 884 587 816	R3 993 290 423	R7 693 451 028	R7 537 048 636
Total PHEV subsidies	R242 106 123	R433 685 904	R467 378 315	R938 863 794	R1 139 266 861
Total BEV subsidies	R975 069 389	R1 577 232 750	R1 619 981 392	R3 105 485 540	R2 953 528 764
Government revenue	R1 574 992 243	R1 873 669 162	R1 905 930 717	R3 649 101 694	R3 444 253 010
Impact of sales revenue vs 100% ICE	R678 542 596	R1 581 249 754	R2 147 765 348	R4 324 864 655	R4 735 342 754
Impact on government revenue vs 100% ICE	R3 522 073 623	R5 758 256 978	R5 899 221 140	R11 342 552 722	R10 981 301 647

Table 19: Subsidies required to equilibrate NEV sales with ICE sales in the South African market (locally assembled and imported vehicles)

	TOTAL MARKET
Price required to maintain demand	R433 522
Subsidy per HEV	R61 305
Subsidy per PHEV	R189 626
Subsidy per BEV	R222 639
Total sales	R191 892 834 318
Total sales (ICE)	R61 755 771 283
Total sales (HEV)	R26 379 715 228
Total sales (PHEV)	R33 389 712 066
Total sales (BEV)	R70 367 635 741
Number of Vehicles	406 849
Number of ICE vehicles	162 740
Number of HEVs	61 027
Number of PHEVs	61 027
Number of BEVs	122 055
Total taxes and levies	R39 368 310 765
Total subsidies	R25 900 545 658
Total HEV subsidies	R3 221 300 997
Total PHEV subsidies	R10 231 297 835
Total BEV subsidies	R12 447 946 827
Government revenue	R13 467 765 107
Impact of sales revenue vs 100% ICE	R37 503 406 110
Impact on government revenue vs 100% ICE	R20 694 438 858

APPENDIX B

Table 20: Modelled values of local vehicle production for the domestic and export markets (for ICE vehicles, HEVs, PHEVs and BEVs*)

BASE PARAMETERS	ICE VEHICLES	HEV	PHEV	BEV
VOP – domestic market	R 205 421	R 230 072	R 293 752	R 312 240
VOP – exported vehicles	R 415 173	R 464 994	R 593 697	R 631 063
Local content % - domestic	42,00%	42,00%	42.00%	42.00%
Local content % - exports	38,00%	38,00%	38.00%	38.00%
Adjusted import content – domestic	R 119 144	R 143 795	R 207 475	R 225 963
Adjusted local content – domestic	R 86 277	R 86 277	R 86 277	R 86 277
Adjusted import % - domestic	58,00%	62,50%	70.63%	72.37%
Adjusted local content % - domestic	42,00%	37,50%	29.37%	27.63%
Adjusted import content – exports	R 257 407	R 307 228	R 435 932	R 473 297
Adjusted local content – exports	R 157 766	R 157 766	R 157 766	R 157 766
Adjusted import % - exports	62,00%	66,07%	73.43%	75.00%
Adjusted local content % - exports	38,00%	33,93%	26.57%	25.00%
Domestic vehicles produced	136 305	136 305	136 305	136 305
Export vehicles produced	281 810	281 810	281 810	281 810
Total vehicles produced	418 115	418 115	418 115	418 115
Total VOP – domestic	R 27 999 909 405	R 31 359 898 534	R 40 039 870 449	R 42 559 862 296
Total VOP – exports	R 116 999 903 130	R 131 039 891 506	R 167 309 861 476	R 177 839 852 758
Total VOP (all production)	R 144 999 812 535	R 162 399 790 039	R 207 349 731 925	R 220 399 715 053
Adjusted import content – domestic	R 16 239 947 455	R 19 599 936 584	R 28 279 908 499	R 30 799 900 346
Adjusted import content – exports	R 72 539 939 941	R 86 579 928 316	R 122 849 898 287	R 133 379 889 568
Adjusted total import content	R 88 779 887 396	R 106 179 864 900	R 151 129 806 786	R 164 179 789 914
Adjusted local content – domestic	R 11 759 961 950	R 11 759 961 950	R 11 759 961 950	R 11 759 961 950
Adjusted local content – exports	R 44 459 963 189	R 44 459 963 189	R 44 459 963 189	R 44 459 963 189
Adjusted local content – total	R 56 219 925 140	R 56 219 925 140	R 56 219 925 140	R 56 219 925 140
Adjusted local content %	38.8%	34.6%	27.1%	25.5%

* ICE vehicle data is based on quarterly 2020 APDP data, as supplied by South Africa's seven light vehicle OEMs. HEV, PHEV and BEV data is per modelled price differentials, assuming all NEV components are imported.

APPENDIX C

Table 21: OEM investment levels in South Africa, 2014-2020, as reported to NAAMSA

YEAR	RM	US$M*	ANNUAL CHANGE (US$)	ANNUAL CHANGE (RAND)
2014	R 6 917	US$636.92	-	-
2015	R 6 603	US$517.07	-18.82%	-4,.4%
2016	R 6 415	US$436.10	-15.66%	-2.85%
2017	R 8 171	US$613.44	40.67%	27.37%
2018	R 7 247	US$546.94	-10.84%	-11.31%
2019	R 7 274	US$503.04	-8.03%	0.37%
2020	R 9 232	US$560.53	11.43%	26.92%
Average	R 7 408	US$544.86	-0.21%	5.99%

* Calculated at average annual Rand-US Dollar exchange rates for the year.

Table 22: Component manufacturing investment levels in South Africa, computed at 39.03% of OEM investment levels**

YEAR	RM	US$M*
2014	R2 700	US$248.62
2015	R2 577	US$201.83
2016	R2 504	US$170.23
2017	R3 189	US$239.45
2018	R2 829	US$213.50
2019	R2 839	US$196.36
2020	R3 604	US$218.80
Average	R2 892	US$212.68

* Calculated at average annual Rand-US Dollar exchange rates for the year.

** Per the average annual difference in OEM and component manufacturer investment levels