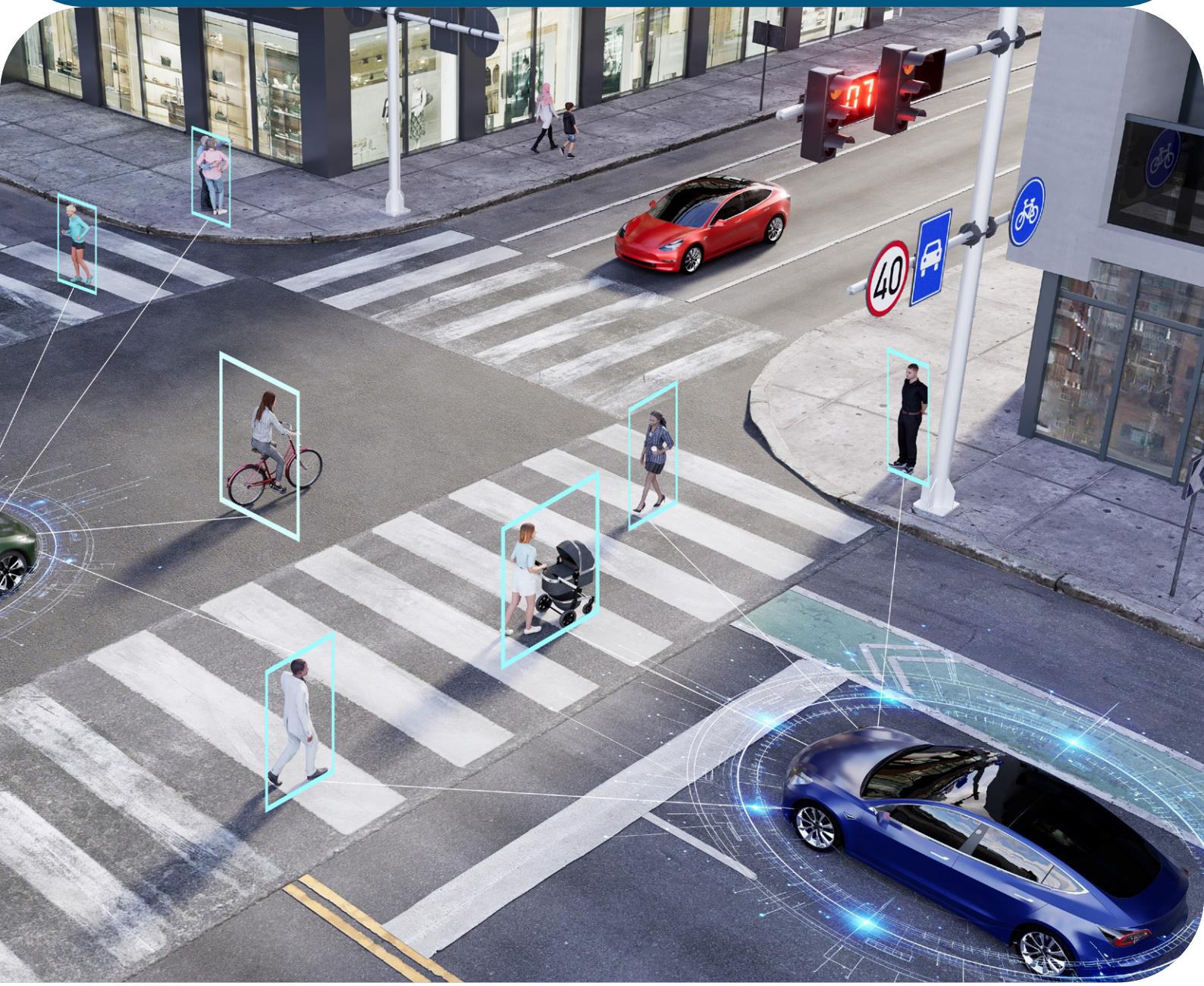
ELECTRIC MOBILITY TRANSITION & LOCALISATION

Towards Unlocking the NEV Value Chain for Africa

STAKEHOLDER ENGAGEMENT REPORT



AIH GROUP

IDC
Industrial Development Corporation

September 2024

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1. EXECUTIVE SUMMARY

Implementing strategies and action plans to migrate from Internal Combustion Engines (ICE) to New Energy Vehicles (NEV) is akin to solving a Rubik Cube challenge with multiple variables across many layers where one action disrupts other layers.

One such Rubik "layer" with its sub-elements in the equation are the many stakeholders with direct and indirect interest and influence in enabling NEV migration. It involves up- and downstream "drivers" and "constraints" on the automotive industry as part of a much bigger NEV transition ecosystem.

The Stakeholder Engagement section of the NEV Value Chain Study sets out the methodology, stakeholder categories and stakeholder organisations, presents the findings, gives an overview of the NEV transition ecosystem, identifies key takeaways and notes potential investment areas to be explored. A high-level overview of the process and findings follows:

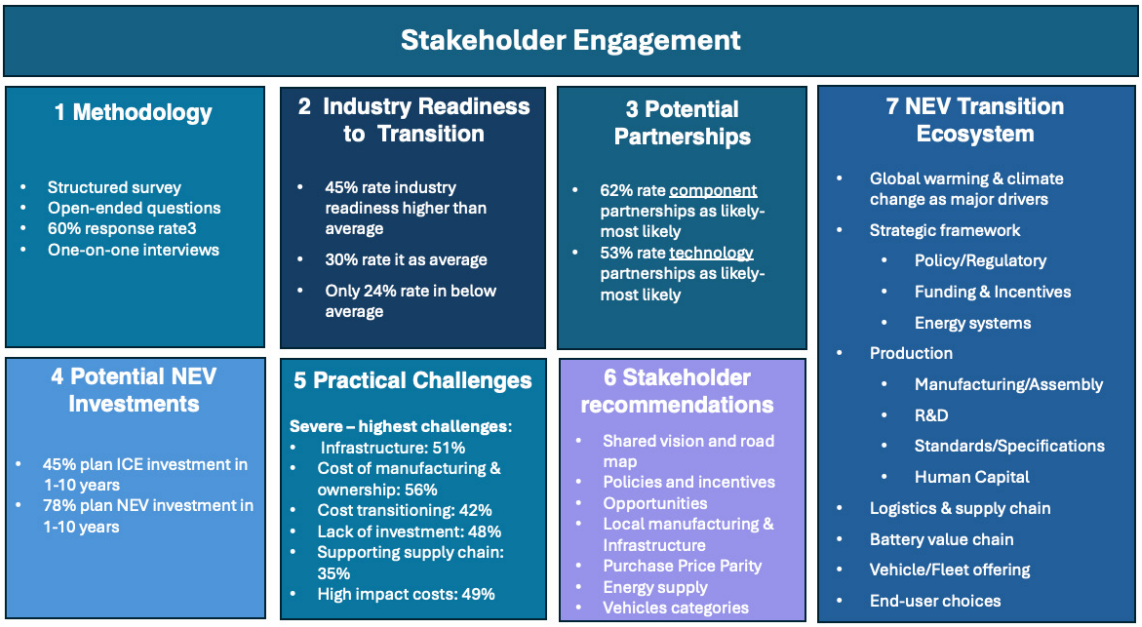


Figure 1: NEV Stakeholder Engagement Overview

This part of the IDC NEV Value Chain Study engaged with a wide range of stakeholders. The survey methodology included structured and open-ended questions on topics such as industry readiness to migrate, challenges and opportunities, potential technology and component partnerships, and investment opportunities.

Noting that the NEV environment is still emerging and in flux with uncertainties, stakeholders were also afforded the opportunities to provide "any additional" comments. Given the divergent interests of stakeholders, the data collected covers a wide spectrum. Complementary to the survey, an additional 12 one-on-one interviews have been conducted.

From the stakeholder engagement a series of key takeaways and investment opportunities emerged, with an overall view that South African OEMs take their cue from their head offices and global industry, affordability is key to NEV growth, with greater NEV policy clarity the NEV opportunities will grow, the 'range anxiety' issue in being dealt with on a 'wait-and see' basis, NEV should focus on 'zero-emissions' to allow 'Green Hydrogen' to be part of the solution, there are niche markets in agriculture, mining and last-mile two-and-three wheeler markets, various African trade blocs and agreements (AfCFTA, ECOWAS and AAAM) create opportunities, charging infrastructure should become a focal element, and NEV migration at scale demands a collaborative effort and the implementation of interconnected strategies.

Four important potential investment opportunity areas emerging from the stakeholder engagement process are:

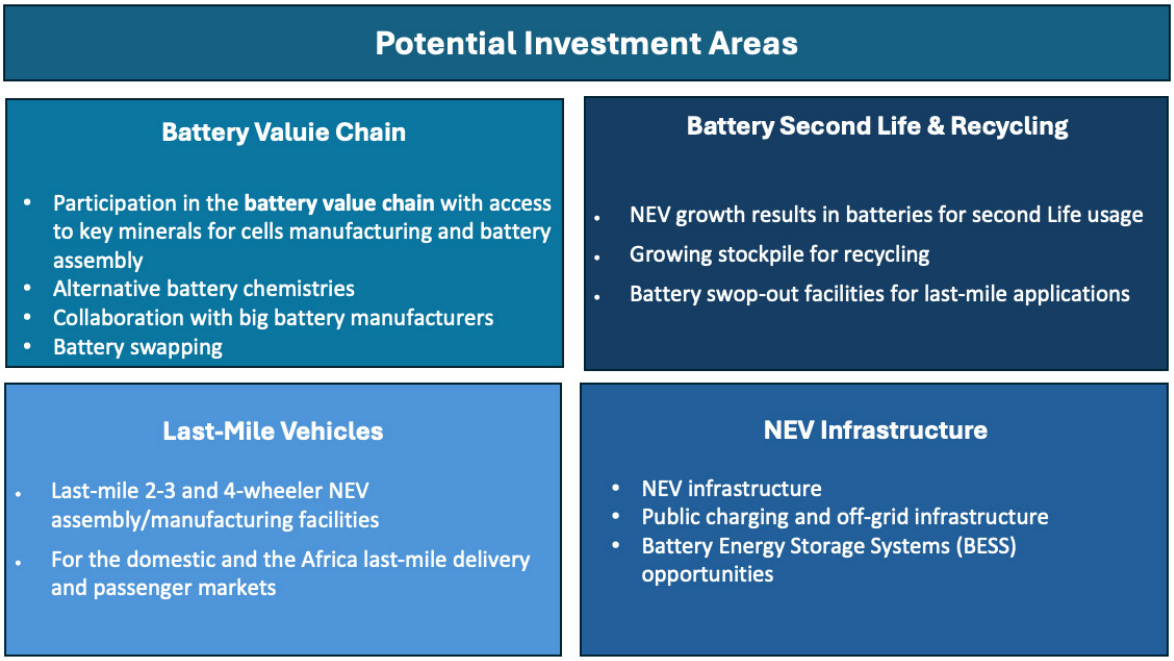


Figure 2: Potential NEV Investment Areas

In conclusion, noting the industry's readiness for NEV migration and greater policy clarity, the following section of the IDC NEV Value Chain Study will develop an investment strategy and explore a high-level feasibility of identified projects.

2. INTRODUCTION

The automotive industry is a crucial pillar of the South African economy and requires the input and support of multiple subsectors to strengthen its contribution to growth and job creation. Vehicle manufacturing body National Association of Automobile Manufacturers of South Africa (NAAMSA) reports that since the implementation of the Motor Industry Development Programme (MIDP) in September 1995, SA's automotive sector has grown to be the leader in the manufacturing sector. The value of vehicle exports from 1995 to 2022 totalled R1.5-trillion, while the export value of automotive components amounted to R893 billion. In 2022, the seven automotive original equipment manufacturers (OEMs) paid R14.69 billion in taxes and duties to the fiscus, helping to fund crucial interventions to improve the lives of millions of South Africans[1].

As part of this study, a stakeholder engagement process flowed from the New Energy Vehicle (NEV) landscape desktop study.

The NEV environment consists of a matrix of diverse stakeholders with multiple perspectives on the continuously evolving variables in the value chain. The aim of the stakeholder engagement is to explore the following:

- The industry readiness to transition and identify opportunities for investment.
- Potential NEV investments.
- Practical challenges, gaps, and gate keepers.
- Recommendations to address identified issues.
- Potential international partnerships for key NEV component localisation.
- An overview and a mapping of the NEV transition ecosystem.

When responding to the request for input during the Stakeholder Engagement phase, the stakeholders warmly welcomed the opportunity to participate. They also highlighted the significance of South African Government and industry stakeholders engaging in strategic planning and aligning policies to address challenges presented by legislated targets. This includes formulating policies that promote the transition to electric mobility, incentivising investment in NEV technology, and cultivating a favourable business environment.

3. METHODOLOGY

The stakeholder engagement consisted of three elements, in a survey format, to obtain responses to the issues raised in the aims mentioned above, as follows:

- A set of quantified questions were posed,
- A set of open-ended questions were posed, and
- One-on-one interviews were also conducted to add to the responses.



Figure 3: Stakeholder Response Rate

The survey was distributed to 90 stakeholders and 54 completed questionnaires were received, giving a response rate of 60%. To encourage open and honest answers, respondents were able to reply anonymously. This high participation rate is seen as a high interest in the topic of the NEV transition and a desire to participate in the process. In addition, 12 one-on-one interviews were conducted.

The surveys were based on confidentiality to ensure that a response cannot be traced back to a specific individual or company. In the interest of conciseness, the quantified, open-ended, and one-on-one responses are "combined" under the structure of the elements of the aims and are reported largely verbatim.

The following stakeholder organisations were engaged with during this phase of the project from the following categories:

Table 1: Stakeholders per Category

Industry Sectors	Organisations
Funding & Incentive	DBSA, DTIC (Automotive), DTIC (Green Industries), Guener Investment,
OEMs and Suppliers	AAAM, BMW SA, Bosch SA, Foton, Hyundai SA, MAN, NAACAM, NAAMSA, Scania, Toyota SA, Volvo Buses SA, Volvo Trucks SA, VWSA
Logistics Industry	SARF, Hovis Logistics, Prosus, Takealot,
Public Transport Industry	GDRT, ITSSA, SA Bus Operators Association, Uber SA
R&D bodies & Universities	Green Cape, Stellenbosch Smart Mobility Lab, Stellenbosch University
Energy Industry	Blueprint Group, Everlectric, Electric Mission, Evesco, EWI2, FlexEV, Gaztron, Kobaloni Energy, Mitochondria Energy Solutions, Nova Economics, Rubicon, Tecomply, Teratrak
Mining & Agriculture Industry	AgriSA, Glencore, SASOL
E-mobility Industry	Green Riders, Gridcars, ITS Africa Working Group, Mellowcabs, Microcare, Oxyon Solutions, Roam Electric
Government Entities	AIDC EC, AIDC Gauteng, Atlantis SEZ, Dept of Transport, EC Provincial Govt, Ekurhuleni Metro, KZN edtea,
Private Companies	Aversa, Goscor, Industry Analyst, MAST (Vodacom), Naspers, Propal Automotive Royal Haskoning DHV, Independents Transport Consultant, Zutari,

4. FINDINGS

The findings of the study are dealt with in the following sections under the headings of the questions posed and responded to. The verbatim responses to open-ended questions are presented in Annexure A to F.

4.1 South African industry readiness to transition and opportunities for investment.

4.1.1 How do you rate your industry's readiness to transition towards NEV?

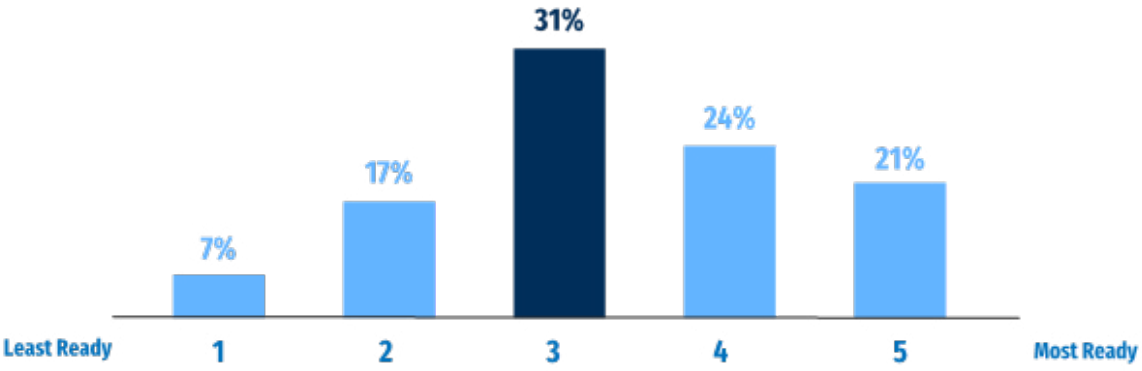


Figure 4: Industry Readiness to Transition

4.1.2 Discussion

The bar chart in the Figure above shows that 31% of the respondents rate industry's readiness to migrate as moderately positive (ratings 4 and 5) with a combined 45% giving a positive response. Only 24% gives a below average readiness response (ratings 1 and 2). This indicates a largely positive sentiment.

It is expected that this positive investment sentiment will improve based on Finance Minister Enoch Godongwana's announcement in the Budget Speech on 21 February 2024. The White Paper outlines the South African Governments strategy to transition towards a broader new energy vehicle production and consumption in South Africa, starting with electric vehicles. It aims to transition the automotive industry from primarily producing internal combustion engine vehicles to a dual platform that includes electric vehicles, by 2035. To encourage the production of electric vehicles in South Africa, government will introduce an investment allowance for new investments, beginning 1 March 2026. This will allow producers to claim 150% of qualifying investment spending on electric and hydrogen-powered vehicles in the first year.

The incentive will be implemented in addition to the existing support under the Automotive Production Development Programme (APDP). Government has also reprioritised R964 million of its budget over the medium term to support the transition to electric vehicles.

With local content an important element in South Africa's automotive industry, the response from NAACAM members spread across different subsectors needs to be noted. They were asked to indicate the importance of various enabling factors for an NEV component manufacturing transition (with 1 being "not important" and 5 being "extremely important").

The highest rating for enabling factors for the NEV migration are for:

- Technology and production incentives.
- OEM demand certainty.

The second highest rating is given collectively to:

- Access to funding/capital.
- Skills.
- Logistics.
- Local availability of correct grade raw materials.
- Government support for foreign tech contract engagement.
- Availability of local testing facilities.

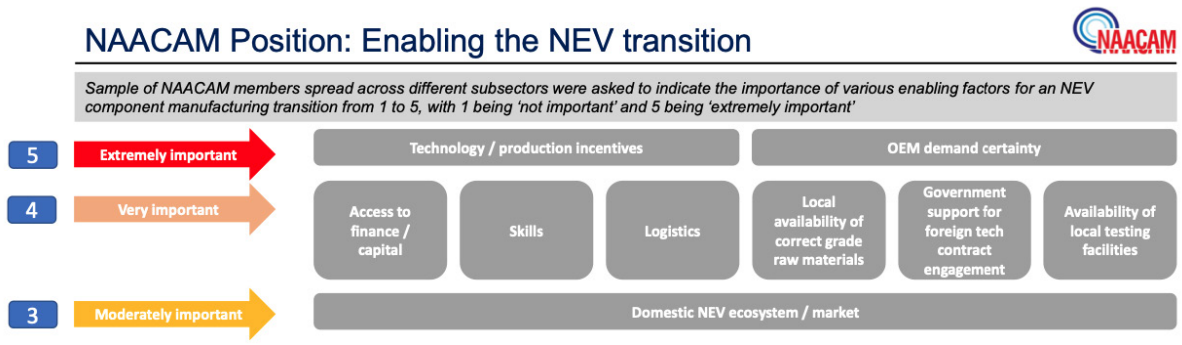


Figure 5: Enabling NEV transition

As a key stakeholder, NAAMSA and The Automotive Business Council welcomed the announcement by Finance Minister Enoch Godongwana that government will offer financial support for the industry to expand from the production of ICE vehicles to a manufacturing line-up that includes EVs. This financial incentive as Phase 1 is a crucial step in attracting investments, fostering innovation, and driving the growth of the NEV sector. Incentives for consumers to buy the more expensive NEVs will form part of Phase 2.

The seven OEMs in South Africa is set to increase with the addition of BAIC SA, Chery and Stellantis. Reservations raised by NAAMSA at present relate to challenges associated with the implementation of the APDP[2], especially concerning vehicles with limited local content due to the predominant location of battery production in Japan, South Korea, and China. In the short-term, the existence of low local content necessitates Government's consideration to also support other key technologies such as traditional hybrids and plug-in hybrids.

4.2 Pipeline of potential NEV investments in SA and Rest of Africa

4.2.1 What are your company's investment plans regarding ICE and NEV?

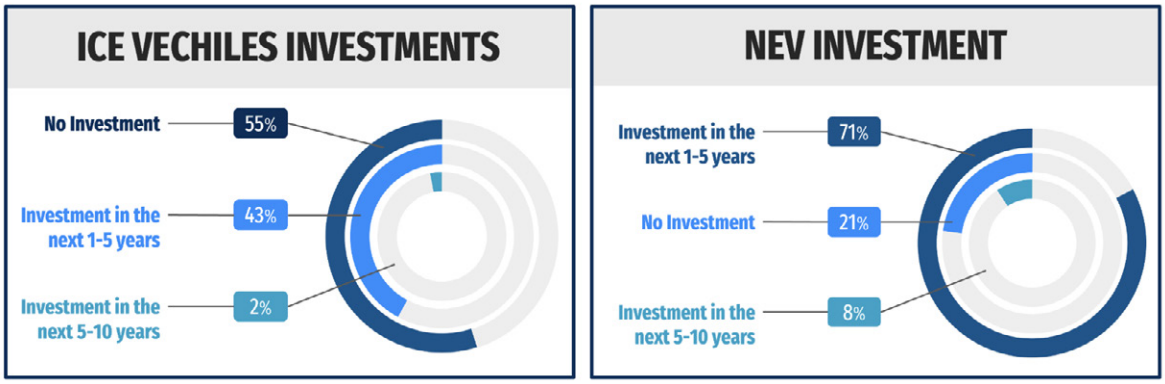


Figure 6: Investment Plans

4.2.2 Discussion

The trend shown in the pie charts in Figure 6 above is that 55% of respondents indicated that for ICE, there are no current investments planned, 43% reporting planned investments in ICE over the next 1-5 years and only 2% in the next 5-10 years. Fewer respondents (21%) reported no current investment plans for NEV, but an increasing 71% reported NEV investments in the next 1-5 Years, 8% reported NEV investment plans in the next 5-10 years.

The Budget Speech announcement introducing an investment allowance for new investments, beginning 1 March 2026 that will allow producers to claim 150% of qualifying investment spending on electric and hydrogen-powered vehicles in the first year is likely impact positively on entering new investment plans into the investment pipeline.

4.2.3 Please specify identified potential opportunities for investment in your sector.

To do justice to the stakeholders, their comments are reported effectively verbatim except for minor typos corrected. Their comments on potential investment opportunities are provided as Annexure A.

Note that specific investment with timelines and amounts are often regarded as company-confidential, respondents abstained from providing details.

Stakeholders are of the view that there will be some component system changes in NEVs, such as:

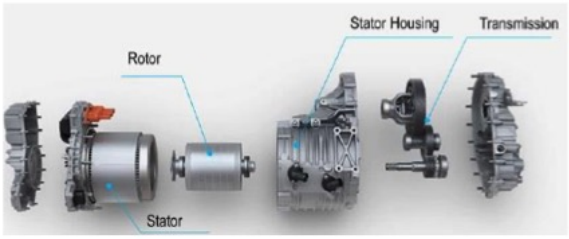
- Smaller ICE in hybrids with none in BEV or FCEV.
- No fuel system and exhaust system in BEV or FCEV.
- Larger batteries, power electronics across platforms.
- Redesigned thermal and cooling management systems.
- High voltage wiring harnesses.
- Incorporation of electric traction motors and redesigned transmission.

The components industry however, via NAACAM, has provided more detailed information specifically on "Sub-Componentry with High Localisation Potential" for the following categories:

- Electric Motor and transmission (e-axle)
- Power electronics sub-components.
- High voltage electrical distribution.
- Battery and battery value chain.
- Thermal management systems.

Electric Motor and transmission (e-axle)

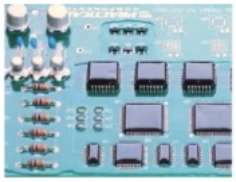
- Most core motor components are expected to be produced in-house by OEMs, such as rotor and stator.
- Electric motor and transmission have potential to be produced locally.



Key components of e-drivetrain

Power electronics sub-components

- Power electronics is expected to be one of the fastest growing sub-sectors over the next decade.
- Localisation potential for PCB assembly and the housing.



PCB Assembly



Housing

High voltage electrical distribution

- Replacement of mechanical systems with electrical necessitates increasing wiring harnesses in NEVs.
- Both high voltage wiring harnesses and the charge port can be localised.



High voltage lines



Charge port

Battery and battery value chain

- Cell manufacturing is not clear cut due to global capacity, OEM commonality issues and other investment and infrastructure requirements. Beneficiation input opportunity for manganese supply to cell manufacturers.
- Raw material availability makes manufacturing the battery management system favourable.
- Existing domestic manufacturing technologies and raw materials makes local battery module and enclosure manufacturing possible.



Battery system

Thermal management systems

- Strong aluminium manufacturing sector and presence of other raw materials makes localisation of heat spreaders, cooling plates and thermal gap pads favourable.
- Existing local players and established aluminium sector makes localisation of HVAC components and assemblies possible.
- Existing raw material makes production of valves, hoses, and pipes favourable.



Thermal management system

Hydrogen fuel cells and tanks

- High localisation potential for fuel cells given local presence of Platinum Group Metals (PGMs) and local players with IP for membrane electrode assemblies (MEAs).
- The tank system is favourable for localisation as there are existing local suppliers of high-density Polyethylene and Polypropylene and capabilities within the aircraft industry to manufacture carbon fibre composites.
- Fuel cell technology primarily suited to medium and heavy commercial vehicles.



Hydrogen fuel cell & tank system

Battery Value Chain

The battery manufacturing value chain has elements where there are potential opportunities for South Africa to participate. High voltage batteries are estimated to account for approximately 30-40% of the value of BEVs, and by 2035 global demand is expected to grow to 6 700 GWh from current installed capacity of 670 GWh.

The World Bank estimates South Africa's battery storage can grow from 270 MWh in 2020 to 9 700 MWh in 2030 – base scenario and 1 500 MWh best case scenario with the possibility to create 58 000 jobs.

With many of the critical rare earth metals available in the Sub-Saharan region, Africa is in a good position to beneficiate these materials. Although there are many obstacles to overcome, a business case for South Africa to participate in this, includes:

- A well-supported sector with long-standing government policy.
- SA is strategically located with numerous ports.
- Access to key materials.
- An existing manufacturing capability providing both key technologies and skilled labour.

Requirements needed to consider participation in the battery value chain include:

- Policy and programme alignment between SADC countries to allow beneficiation of raw materials locally.
- Good rail logistics corridors for transport of minerals.
- Demand certainty led by OEMs but also built around industrial storage parallels.
- Supply certainty and cost of raw materials.
- Pilot projects demonstrating beneficiation outcomes.
- Detailed feasibility to determine of the elements in the battery value chain can be pursued.

Beneficiation

South Africa is the overall largest manufacturer in Africa with 54,4% in 2023 and Morocco with 45,5%. As global trends transition to NEVs so will SA be required to follow suite. The first step is to establish a critical materials beneficiation value chain in collaboration with other African countries. Next South Africa can move to cell manufacturing and battery manufacturing/assembly. Finally, since the battery is a critical component of NEVs, it would not be difficult for SA to start manufacturing NEVs, supported by a fully African value chain (see section above).

Second-life applications and recycling

The number of NEVs is expected to grow exponentially, and with that the number of batteries used, irrespective of its origin. The resulting opportunity for second-life applications and recycling requires further investigation.

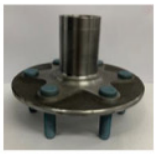
Examples of existing NEV component exports

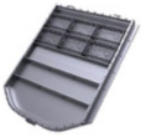
Listed below are examples of what local suppliers have already commenced producing for NEVs. It is worth noting that a large cohort of NAACAM members are multinational companies, whose sister plants across the globe are already producing components for NEVs and have NEV-specific Research and Development (R&D) which could be onshored by the local subsidiaries. Many components produced locally are not power-train specific, meaning they already have the technologies and capabilities to support domestic NEV production.

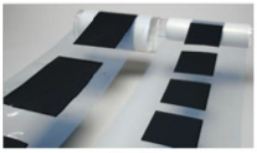
It is worth noting that SA based component companies have been responding to technology changes for years, as facelift and new models emerge.

Examples are:

- Forged components: A locally owned foundry and forge business is exporting wheel hubs to the US as a Tier 2. They are used in the production of a high-volume electric vehicle launched in the States in mid-2022.
- Beneficiated materials: A manufacturer of processed raw materials has a large export contract with an OEM for the supply of components into the battery housing of their EV range.
- Fuel cells: Hi-tech fuel cell and electrolyser component manufacturing facility currently being established to produce PGM-containing membrane electrode assemblies (MEAs).


Wheel hub


Battery housing


MEAs

4.3 Practical Challenges and Recommendations related to NEV

4.3.1 Rate how the following challenges may impact your business with regards to NEV

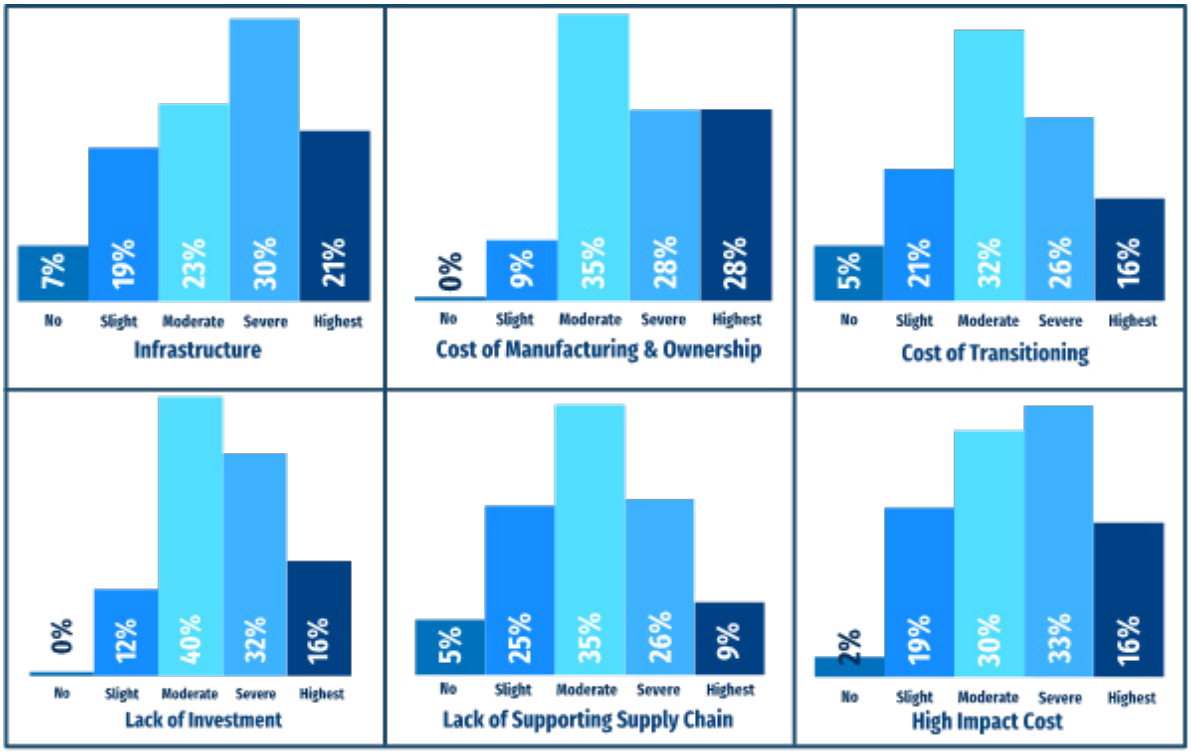


Figure 7: Impact of Challenges

4.3.2 Discussion

Respondents were asked to rate the degree to which various challenges are impacting their business. Regarding infrastructure challenges, 30% of respondents identified it as a significant hurdle. When it comes to challenges related to the cost of manufacturing or ownership, 35% of respondents categorised it as a moderate obstacle. Transitioning to NEVs posed a moderate challenge for 32% of respondents in terms of cost.

Lack of investment was seen as a moderate challenge by 40% of respondents. Similarly, 35% of respondents found the lack of a supporting supply chain to be moderately challenging. Meanwhile, 35% of respondents regarded the lack of a supplier network as a moderate challenge. Lastly, high impact costs were considered a severe challenge by 33% of respondents. In each of the challenges presented, most respondents indicated it posed at least a moderate challenge.

4.3.3 Challenges relating to the impact towards NEV

In summarised fashion respondents note the following challenges (for verbatim responses see Annexure B.)

- On energy it is insufficient and erratic power supply from the national grid, together with above-inflation cost increases. On future energy provision, their challenges include uncertainty about which technologies and battery chemistry options will become dominant, the required expansion of the recharging infrastructure and battery energy storage systems.
- On technology it is noted that South Africa, by and large, is not an innovator but follows the lead of parent companies. Funding for R&D is limited, especially in an environment where technology is in flux.
- It is a challenge that the migration from ICE to NEV will reply on only supply-side measures in the absence of demand-side encouragement.

4.3.4 Recommendations relating to the impact towards NEV

In summarised fashion respondents offered the following recommendations (for verbatim responses see Annexure C.)

- The knowledge and skills needed for NEV production and support increase several notches and require comprehensive skills development programmes.
- Policies and regulations need to accommodate consequences of NEVs, especially in the freight environment with vehicles being over-weight and over-length because of the weight and size of battery packs.
- The current out-dated bus contract models constrain the public transport industry from NEV migration at scale.
- To enable a multi-sectoral process towards NEV migration, a shared vision and enabling strategic framework is vital. The mechanisms provided for under the JET-IP programme may be the ideal structure for this.
- In a global industry that is fast-moving, the speed of local policy development needs to speed up dramatically and significant levels of new investment are required.

4.4 Potential international partnerships for key NEV component localisation and development of innovation and technology development

4.4.1 Rate your potential for international component partnerships.

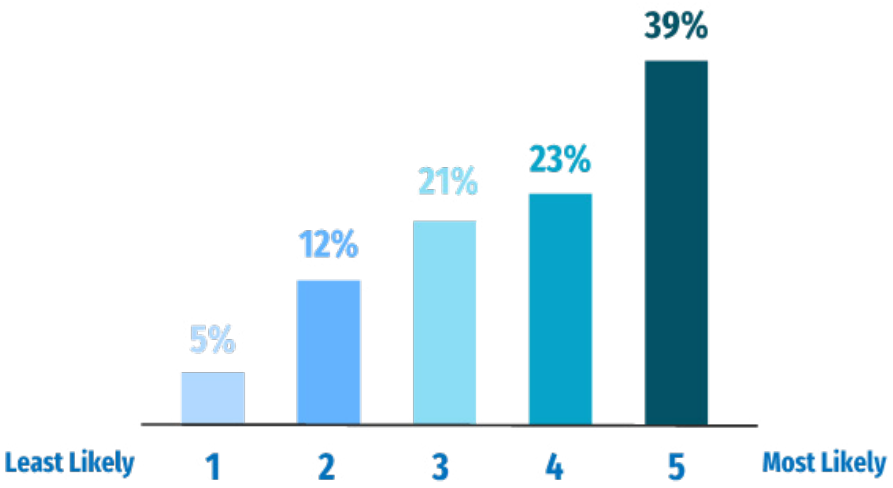


Figure 8: Component Partnerships

4.4.2 Discussion

The bar chart in Figure 8 above shows how stakeholders rated the potential for international partnerships regarding NEV component localisation. Numbers one to five on the X-axis represent the potential rate; one being a low potential rate while five being the highest potential rate. 39% of the stakeholders reported a very high potential rate for international partnerships for NEV component localisation in South Africa. Only 5% of the stakeholders gave the lowest rating for potential international partnerships regarding NEV component localisation. This data shows that stakeholders believe that international partnerships for NEV component localisation have promising potential.

4.4.3 Elaborate on international component partnerships.

South Africa benefits from technology R&D by parent companies, but on a component level it plays a bigger role. It is financially beneficial for international partners or collaborators to conduct component R&D in ZAR rather than in Euro or US Dollar. In many cases NEV components are common or modular across several vehicle platforms and this raises the issue of anti-competitive practices. To manage this, the EU has for example softened anti-competition laws to allow support of battery production in Europe, therefore making it easier for OEMS to partner on NEV initiatives. South Africa has a well-established components industry with the ability to adjust to many of NEV needs. Verbatim responses are presented in Annexure D.

4.4.4 Rate your potential for international technology partnerships.

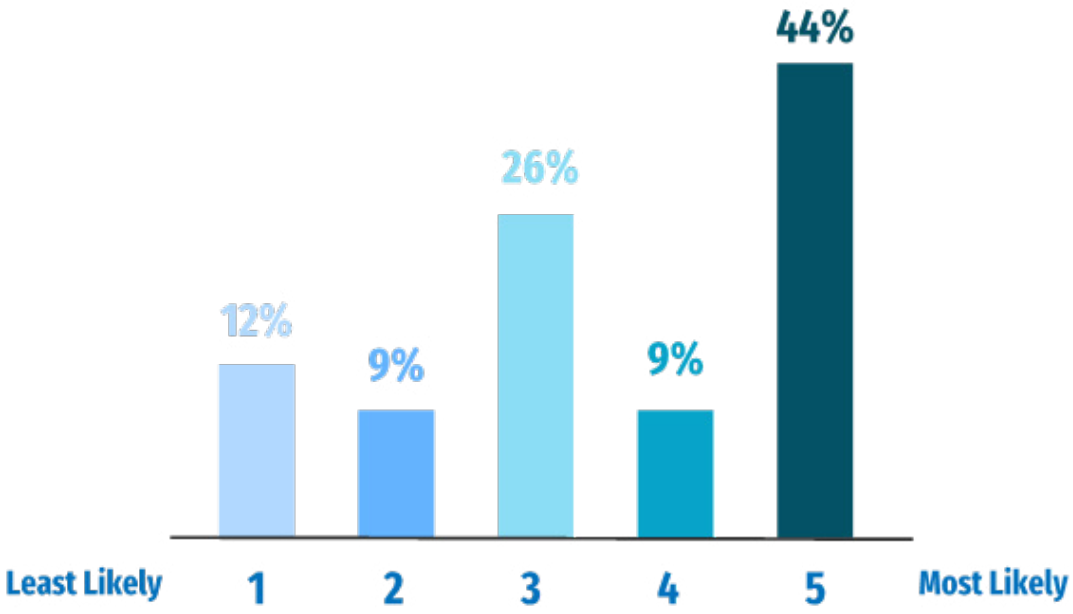


Figure 9: Potential for Technology Partnerships

4.4.5 Discussion

The bar chart in Figure 8 above shows how stakeholders rated the potential for international partnerships regarding NEV technology development. Numbers one to five on the X-axis represent the potential rate; one being a low potential rate while five being the highest potential rate. 44% of the stakeholders reported a very high potential rate for international partnerships for NEV technology development in South Africa. Only 12% of the stakeholders gave the lowest rating for potential international partnerships regarding NEV technology development.

4.4.6 Elaborate on international technology partnerships.

Break-through technologies come mainly from parent companies and much of the core technologies are developed by holding companies, with localisation and "fit for purpose" modifications locally made for the SA environment. However, the complexity, cost, risks, and dynamic interrelationships in technology development will make SA more of a collaborator than a leader.

The above is a summary of what stakeholders reported, i.e. as "assembly" industry rather than manufacturers, the hard-core R&D is done by parent company for all that OEM's operations across the globe. Verbatim responses are presented in Annexure E.

4.5 Do you have any other comments you would like to make?

4.5.1 Additional Comments Summary

Stakeholders were afforded the opportunity to provide comments in addition to the open-ended questions in the structured survey, with their verbatim comments presented in Annexure F with Figure 10 providing a high-level summary.

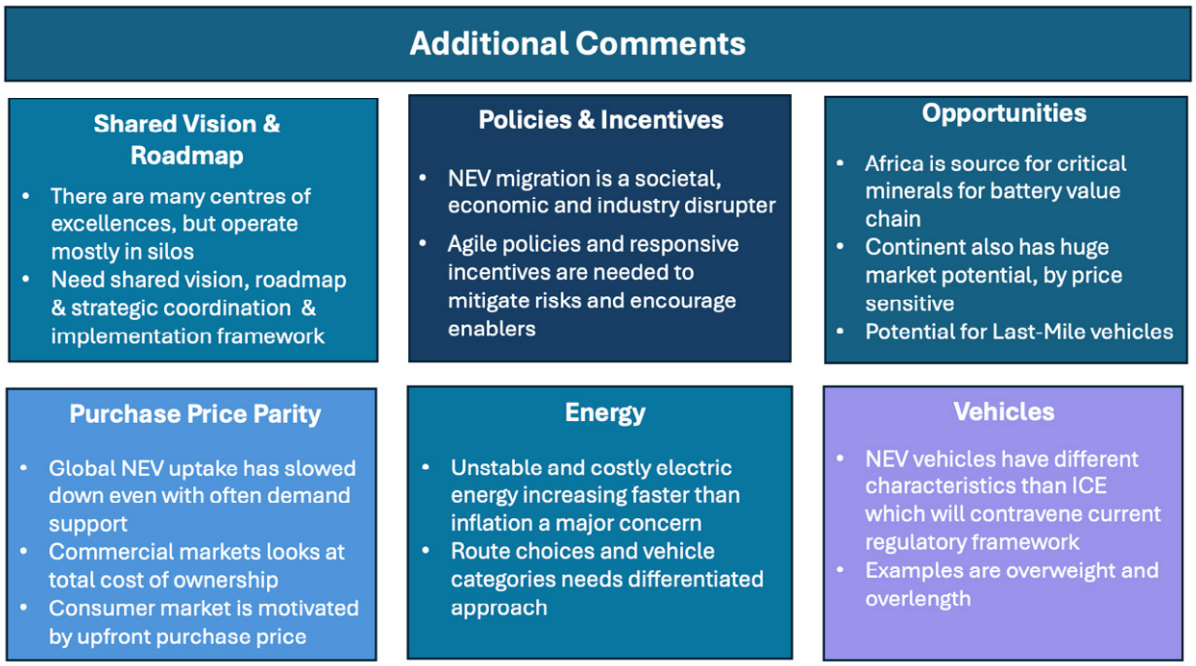


Figure 10: Additional Comments Summary

5. NEV TRANSITION ECOSYSTEM

5.1 Introduction

The rate of adoption for full NEV technologies across South Africa and the rest of Africa will be slower relative to other major markets. This provides for the NEV ecosystem to migrate more slowly to NEV, with technologies maturing while phasing out existing ICE fleets over a longer time frame. A risk in this is that in some cases windows of opportunity may close if not proactively pursued.

This requires political will and leadership to develop a strategic framework with a common overall vision guiding the planning and implementation of specialist sectors in their respective fields. The "engineering side" of the automotive industry comprises of only some of the sub-systems of a much wider ecosystem with its a matrix of multiple moving parts.

The global automotive industry is increasingly characterised by collaboration and often also cross-ownership. The greenfield nature of much of the NEV ecosystem encourages risk mitigation and collaboration.

The possibility of break-through technologies, start-ups and disruptive companies establishing themselves at the expense of those with legacy systems and cultures will require more collaboration, inter-company cooperation and working across industry sectors.

There are many sector strategies and plans developed and integrating this into an overall national strategy is work in progress aiming to best align the multiple stakeholders.

- A mass uptake of entry- and mid-level BEV in due course will demand a drastic relook of the charging infrastructure. Many thousands of middle and especially lower-come households and apartment dwellers do not have garages and access to private charging facilities or rely on on-street parking. In the absence of a business case for commercially developed infrastructure, they cannot be left off the grid.
- A global shift is underway in the automotive world towards countries such as China, Korea, and India. Many of these OEMs are perceived to be "dumping" cheap imports into Europe and the US, igniting severe competition and perhaps even trade conflict if/when countermeasures are implemented. With South Africa importing (or locally assembling) from these OEMs while our export market is directed towards Europe, our imports may draw us into the middle of this global trade conflict.
- A major strategic issue is to determine what the South African automotive industry will comprise of in 10 or 15 years: what will we manufacture for the domestic and export market and what will be imported and how will these cheap imports impact on the local industry. Which of the 7 current OEMs will be part of the future industry? Will BYD set up a local facility?
- SA failed to rehabilitate and improve our logistics infrastructure and has broken promises about rail and harbour to the likes of BMW and Mercedes for logistics solutions on which some of their investment decisions were based.
- The ICE to NEV migration is multi-faceted and highly complex with multiple moving parts. If DTIC does not have sufficient resources and capacity, it may be worthwhile to add capacity through private sector secondment but not bringing a specific OEM's viewpoint to the planning and decision-making process.
- There are very powerful vested interests against NEV migration, such as:
  - Government ministers who favour the coal mining sector.
  - Politically and financially powerful lobbyists against NEV, or trying to delay and frustrate the migration, such as retail refuelling interests who are making very good money from selling petrol/diesel and would want to continue to profit from this. Many of the fuel retailers are believed to be owners of taxi fleets which may work against migrating Minibus-Taxis to NEV.

- The township economy (dominated by retail but with the township mechanic industry as a subset) has a total market value estimated at R900 billion with approximately 60% of the market considered formal and 40% informal. There are around 80 000 "kasimechanics" and panel beaters in South Africa consisting of informal, independent and company-aligned businesses. The industry has gained valuable business specifically from independent e-hailing drivers. About 40% of the cars on SA's roads are unfinanced and is a potential "kasi" customer base. The NEV migration holds a risk for kasimechanics, but initiatives such as that of the Gauteng Provincial Government's Township Economic Development Act (accompanied by a substantial fund totalling R600 million) could assist in upskilling and reskilling kasimechanics.
- There are several factors that play a role in the electrification of a national fleet, such as GDP and national net-zero commitments, but government support through legislation, ambitions and targets are critical in developing an electric ecosystem and scaling EVs.
- Net-zero commitments of a country paint a backdrop of the urgency by politicians and policymakers to transition to EVs. But particularly influential within the NEV ecosystem is the availability of financial incentives.

5.2 Systems approach

The essence of a system is that the whole is bigger than the sum of its parts. The point of departure for the NEV Transition Ecosystem lies in global warming and the necessity to mitigate the devastating effects of climate change. From a "helicopter view" perspective of this inter-related matrix, it cascades down to the need to develop zero-emission vehicles and reduce transport and logistics sector's carbon footprint.

We traverse the key issues in the following sections.

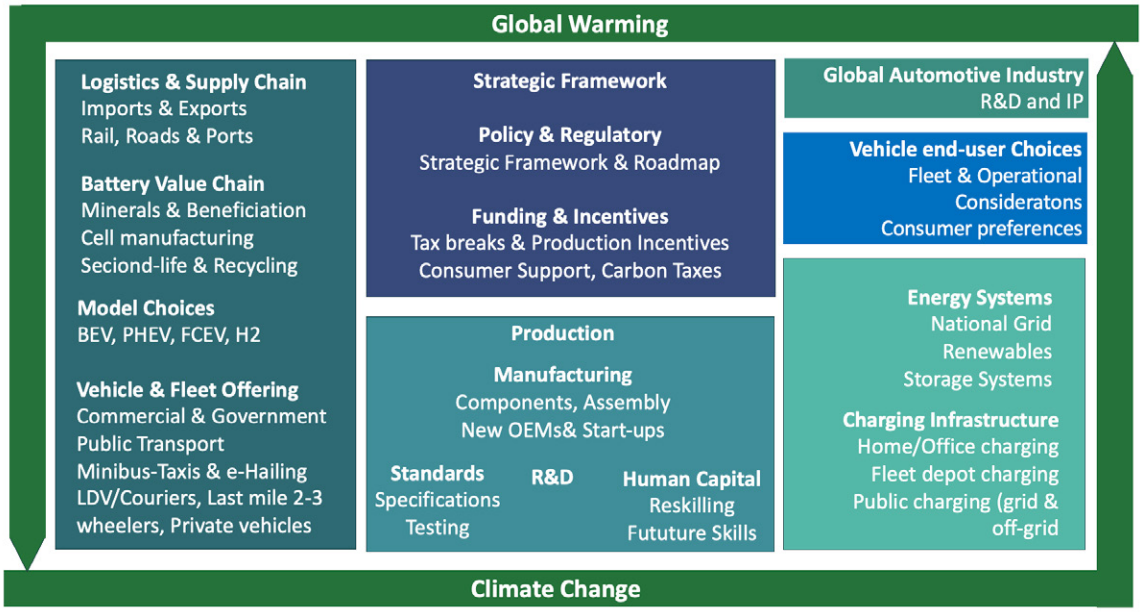


Figure 11: NEV Transition Ecosystem with Inter-Related Subsystems

5.2.1 Global Warming and Climate Change

Table 2: Global warming and climate change

Dicussion	Key Role-players/action areas
Global warming and the potentially devastating effects of climate change is well documented. The transport sector, as lifeblood of society, must aggressively reduce its carbon footprint. This is a complex endeavour to make the transition from ICE to NEV, whilst simultaneously maintaining and growing economic activity, and creating employment opportunities.	• Climate Change. • COP28 and carbon trading • Transport and Logistic sector's carbon footprint. • Global move towards zero emissions vehicles.

5.2.2 Strategic Framework

Table 3: Policy and Regulatory

Dicussion	Key Role-players/action areas
Interventions to achieve climate change targets are long-term, complex, and costly and yet also urgent. Such interventions must be expedited and require strong and unambiguous measures across multiple sectors, with changes in one affecting other sectors.	• Treasury & SARS. • The DTIC • Dept of Transport • DMRE, DSI, DFFEA. • SA's Nationally Determined Contribution (NDC). • Presidential Climate Commission. • Energy Council of SA.

Table 4: Funding and Incentives

Dicussion	Key Role-players/action areas
South Africa 's automotive industry plays a crucial role in the manufacturing sector, is a major earner of forex and an employer of note. "Retrofitting" it to NEV while simultaneously running ICE production lines and support systems is a major undertaking requiring substantial policy and incentive enablement.	• Treasury/SARS. • DFIs (IDC, SADB, AfDB, AFREXIMBANK) • Provincial Governments (Bus Contracts). • JET-IP. • New MNC investors.

Table 5: Energy Systems

Dicussion	Key Role-players/action areas
"Dirty" energy in its many forms is a major cause in global warming, and clean and sustainable sources of energy is a key variable. The transport sector's heavy reliance of fossil fuels makes it a major source of CO_2 and related emissions.	• Eskom National Grid. • Sustainable energy providers. • Charger and infrastructure providers and installation. • Fuelling stations as Charging Facilities. • Energy Storage Solutions. • Second-life use and recycling. • Future Energy R&D (H2, Ammonia). • Urban/Land-use and Transport Planners and authorizing authorities. • Safety and security. • Payment Systems.

5.2.3 Production

Table 6: Manufacturing/Assembly

Dicussion	Key Role-players/action areas

Competition in the domestic and export markets is likely to grow exponentially. The seven OEMs currently based in SA may see their number grow to nine with the expected entry of Chery and Stellantis as local assemblers, in addition to fully built imports. Stellantis is a new entry and BAIC is to start manufacturing in 2024 after being delayed by COVID-19. Component suppliers and assemblers are identifying collaboration and partnerships to improve competitiveness.	• OEMs
	  – Locally based.
	  – Importers.
	• New OEMs.
	• Component Industry.
	• NAAMSA, NAACAM.
	• ECOWAS.
	• AAAM.
	• NEV Start-ups.
	• Last-mile assembly/manufacturers of 2-3, 4- wheelers).

Table 7: Research and Development

Dicussion	Key Role-players/action areas
Industry players are facing cut-throat competition with innovation crucial to success. R&D is resulting in new energies, materials, and processes.	• OEM and commissioned R&D. • Component Industry and light-weight materials. • Battery manufacturers. • NRF, TIPS, CSIR. • CoEs, Universities.

Table 8: Standards

Dicussion	Key Role-players/action areas
New technologies, materials and process require a new generation of standards, specifications, certification processes and testing to ensure compliance, including new metrics for quality systems and Safety, Health and Environmental (SHE) systems.	• Standards & Specifications. • NRCS, SABS, SANS/ISO. • Testing and Certification. • SHE metrics and compliance.

Table 9: Human Capital

Dicussion	Key Role-players/action areas
Line with the changes introduced by the Fourth Industrial Revolution the workforce must be re-skilled and new curricula introduced for shopfloor, FET and TEI training to meet the future skills needs.	• Training. • Re-training. • New skills development. • TEIs/FETs for new curricula.

5.2.4 Logistics and Supply Chain

Table 10: Logistics and Supply Chain

Dicussion	Key Role-players/action areas
With two main automotive hubs (Durban and Eastern Cape) in coastal regions they are well situated for imports and exports, but far away from domestic markets. The Gauteng-based hub has long in- and export corridors but is closer to domestic markets (except Cape Town and Durban). Support is provided by SEZs and IDZs.	• Long import/export corridors. • Durban port congestion. • Ports of East London, Port Elizabeth and Ngqura. • Heavy Freight logistics network. • SEZs and supplier/industrial parks such as Coega, ASEZ, TASEZ, Rosslyn ASP.

5.2.5 Battery Value Chain

Table 11: Battery Value Chain

Dicussion	Key Role-players/action areas
Batteries account for around 30% of the value of NEVs and with its weight the ideal logic is to have batteries manufactured as close as possible to the end-market. While a local/ regional battery plant may be regarded as cost prohibitive, some form of participation in the battery value chain offers significant benefits, especially with several key materials available on the African continent and a potential cooperative framework in the African Continent Free Trade Agreement. In addition, alternative battery chemistry options are also emerging.	• Minerals suppliers. • AfCFTA. • ECOWAS. • AAAM. • Beneficiation industry. • Cell production. • Battery manufacturing. • Second life applications. • Recycling.

5.2.6 Vehicle and Fleet Offering

Table 12: Vehicle and fleet offering

Dicussion	Key Role-players/action areas
South Africa's freight and passenger rail services have collapsed and moved over to road-based transport. This modal shift, however, resulted in a large domestic market in addition to the established vehicle and component export market. One side of the coin is the offering presented to users; the other side is the choices made by buyers.	• Fleet vehicles (Public Sector: Education, Health, SAPS, SADF, ACSA, Provinces, Metros). • Vehicles for Commercial, Agricultural and Mining. • Public Transport (Buses, MBTs and staff transport). • Light delivery and courier vehicles. • Ride-Hailing Services. • Rental Agency vehicle fleets. • Last-mile 2- and 3-wheelers. • Micro-mobility vehicles. • Entry-level to luxury vehicles for commuters.

5.2.7 Vehicle End-user Choices

Table 13: Vehicle end-users

Dicussion	Key Role-players/action areas
The other side of the coin, and a key driver in the NEV migration interactive process, are the choices that vehicle end-users make. Soft issues such as this are often ignored or under-valued. Vehicles are not built as an end-goal, but for users.	• Buyers "vote" with their wallets. Commercial and fleet users will base their "vote" on total cost to company and the residual value at the end of its life cycle. • Individual buyers will be strongly guided by up-front cost. • Mass uptake will require "Effective Parity" incorporating factors other than just up-front purchase price, such as range, ease and cost of recharging, insurance and maintenance cost etc. • Other concerns such as residual value and re-selling of NEVs.

6. STAKEHOLDER ENGAGEMENT SUMMARY

6.1 Migration readiness

Stakeholders indicated a positive perception towards the industry's readiness towards NEV migration with a combined 76% rated it moderately to most ready. After the survey was completed, the 2024 Budget Speech announced additional production support measures which is shifting perceptions to an even more positive position, while noting that the incentives will only come into effect in 2026. While leaving a void till then for new investments, it does provide for a planning and ramp-up process.

6.2 Investment plans

For ICE investments, a majority of 55% say they currently have no plans, while 43% plan to invest in the next 1-5 years, dropping off sharply to only 2% in 5-10 years. For NEV investments, 71% had plans for the next 1-5 years, but only 8% had investment plans in place for 5-10 years, probably waiting for the Government to announce its production support plans as envisaged in the White Paper and announced in the Budget Speech.

Several investment opportunities, specifically on the sub-componentry level with high localisation potential, were identified. These will be discussed in the report to follow on NEV Investment Strategy.

Some of the Chinese OEMs and battery manufacturers that were met by a SA delegation, may well establish a local footprint.

6.3 Challenges

Respondents rated the impact of the following challenges as severe and high impact (combined):

- Infrastructure 51%
- Cost of manufacturing 48%
- Lack of investment 48%
- Lack of supporting supply chain 35%
- High impact cost 41%

6.4 International Partnerships

Many component manufacturers are part of a global group and hence has essentially direct access to global partnerships for component and technologies. Potential international partnerships (most likely to be combined) were rated as follows:

- Component partnerships 62%
- Technology partnerships 53%

6.5 Stakeholder Recommendations

A summary of recommendations by stakeholders include:

- Develop a shared vision and strategic road map for NEV migration,
- Overcome institutional fragmentation within government on national level, across levels of government, and between government and industry,

- Build flexibility into policies and programmes,
- Encourage collaboration within the automotive sector and between different economic sectors (e.g. mining, agriculture, construction, defence),
- Explore regional collaboration based on AfCFTA to support regional value chains,
- Explore all options within the battery value chain. It can offer huge opportunities, but carries significant risks, and a collaborative approach may well be required,
- Customise incentives to build resilience in local and export initiatives,
- Don't exclude HCV/XHCV from planning,
- The fast growing last-mile delivery segment, including 2-3-4-wheelers EVs, requires a deeper investigation. This will include looking at a combined SA and African market, as well as battery swap-out models,
- Revise current legal length and weight restrictions for NEV HCVs,
- Apply AIS support to all zero /low and carbon neutral emissions, and
- Deepen local NEV supply chain.

6.6 NEV Transition Ecosystem

In providing a "helicopter" view on the NEV transition ecosystem, a systems approach was used. The essence of a system is that the whole is bigger than the sum of its parts. The point of departure for the NEV ecosystem lies in global warming and the necessity to mitigate the devastating effects of climate change and reduce the carbon footprint of the transport sector.

The subsystems within the ecosystem are inter-related and changes in one are likely to effect changes in others. Policy changes and implementation plans for one of the system elements need to consider unintended consequences in another. For example, if NEV HCVs are over-length and over-weight to accommodate its battery packs, current legislation and regulations must change to accommodate this. This, in turn, requires changes in law enforcement training and protocols, and road safety measures in terms of the stopping distance needed by heavier vehicles, and its impact on road maintenance.

It is often remarked that the change from ICE to NEV is almost as profound as moving from horse-drawn coaches to automotive vehicles. This requires a societal-wide response.

While there are many excellent strategies and plans across public sector entities, and many others in the private sector, there is clear lack of a holistic and synergetic NEV paradigm guided by a national NEV strategic roadmap.

7. KEY TAKEAWAYS AND OPPORTUNITIES

7.1 Key Stakeholder Takeaways

From the stakeholder engagement the following key takeaways emerge:

- Rather than being an innovator, the South African OEMs take their cue from their head offices and the global industry, which is forging ahead with NEV, but currently with some cutbacks in production volumes.
- As affordable NEV models become more readily available, the domestic market take-up will increase, but off a very low base.
- Local assembly operations by BAIC SA, Chery and Stellantis, in addition to existing OEMs, are opening new opportunities.
- The support measures announced in the Budget Speech, effective 2026, pave the way for EV production and support planning for passenger car and LCV (pickup) assembly.
- With greater NEV policy clarity, the list of specific investment opportunities will grow, and more plans be implemented, supporting a deepening of the supply chain.
- The relatively long distances travelled in South Africa, makes "range anxiety" more acute, and the policy favouring BEVs will create a "wait-and-see" approach from many buyers, and will limit NEV uptake. This view is supported by the Ford 2024 Trend Report based on a global survey. The Trend Report found that 47% more people say they should drive battery-electric vehicles, yet only 4% say are ready to own one themselves[3].
- The NEV opportunity paradigm should focus on "zero-emissions" and not exclusively on "electric". Parallel Government and industry initiatives on "Green Hydrogen" and the "Hydrogen Economy" should remain on the NEV agenda for opportunities that may arise.
- Moving people, goods and services are predominantly done with road-based transport. Apart from the consumer NEV market, there are many fleets, public and private sector, and in niche markets such as agriculture and mining, that offer "low hanging fruit" for NEV. In addition, on the back of rapidly growing e-commerce, or "e-tail" a new market for last-mile two- and three-wheelers have emerged. When the domestic and African market is combined, a strong market opportunity may emerge, but with a fast-closing window of opportunity.
- With assistance from structures such as the African Continent Free Trade Agreement (AfCFTA), Economic Community of West African States (ECOWAS) and the African Association of Automotive Manufacturers (AAAM), regional automotive hubs can be strengthened to play a substantive role, especially in the battery value chain. South Africa and the continent have access to critical materials and pilot projects for beneficiation are in operation. Opportunities also include battery component manufacturing, second-life applications and recycling. Battery chemistry developments, such as BYD supporting sodium-ion battery manufacturing, may offer SA an entry into battery manufacturing.
- Existing players in charging infrastructure include OEMs, dedicated local charging infrastructure companies and commercial operations such as at shopping malls and in office complexes. They are joined by new investors aiming at off-grid solutions. These expansions will mitigate "range anxiety" and encourage NEV uptake.
- Globally it is evident that NEVs are more expensive than its ICE equivalents and manufacturing stakeholders are of the view that without some kind of market support to encourage South African NEV demand, the NEV transition will struggle to get out of the blocks without strong domestic demand.
- The global role of AI to speed up design and engineering solutions compared to the very long lead time to make policy decisions carries a risk of impacting on the SA automotive industry's relevance for model cycles.

- Achieving NEV migration at scale demands a collaborative effort within the ecosystem, and the implementation of interconnected strategies.

7.2 Potential NEV Opportunities

Four important potential investment opportunities emerging from the stakeholder engagement process are:

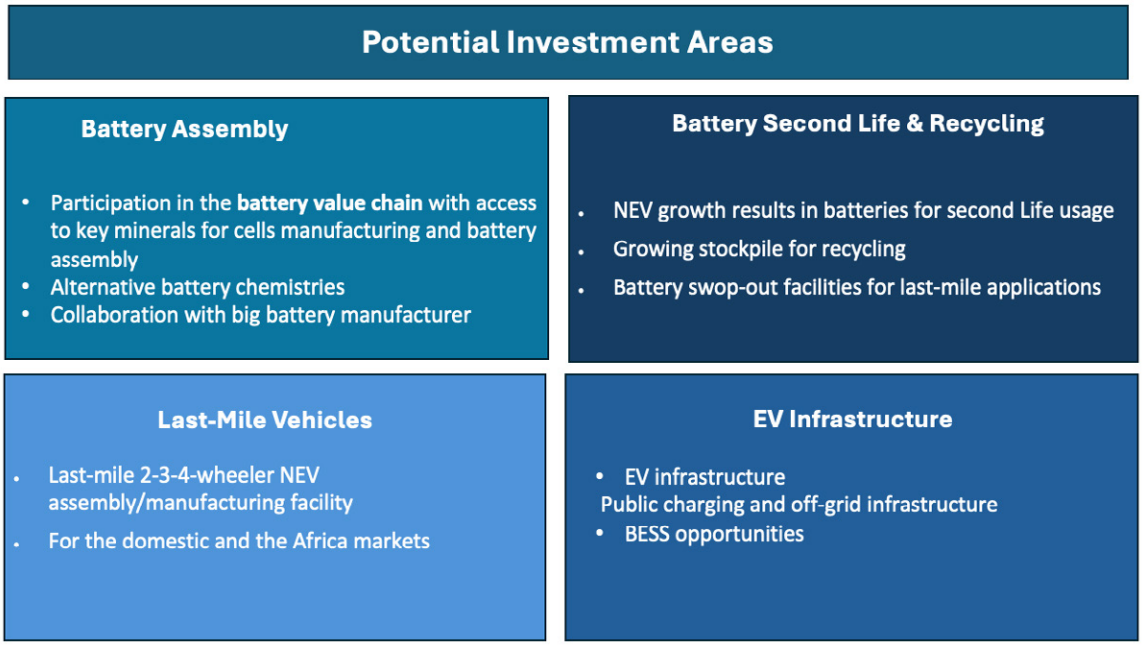


Figure 12: Potential Investment Areas

In conclusion, noting the industry's readiness for NEV migration and greater policy clarity, the following section of the NEV Value Chain Study will develop an investment strategy and explore a high-level feasibility of identified projects.

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9. APPENDIX

**The views/stakeholder inputs expressed below are not that of the IDC but of survey participants.*

9.1 Annexure A: Investment Opportunities

Input Category	Stakeholder Inputs
Energy and Charging	• South Africa presents abundant opportunities for expanding EV charging infrastructure, particularly within shopping centres. • Noting the stress on the national grid, these is scope to develop renewable charging stations across the country. • Entry of mega NEV manufacturers such as BYD SA, BYD and Stellantis are game changers, opening new opportunities.
Battery Value Chain	• The battery value chain, in a continent-wide context, may hold good investment potential. Good availability to critical minerals, but cross-border complexities must be overcome, and urgently before alternative supplies chains get established. • When the market moves towards entry- and mid-level vehicles, the number of batteries required annually may well present a business case to strengthen the domestic battery value chain developing into component manufacturing and battery assembly, but this must be planned for proactively. • Investment opportunities abound in various sectors of the battery industry: – Lithium Iron Phosphate (LiFePO4) batteries offer promising prospects for investment. – Hydrogen Fuel Cell Vehicles (FCVs) represent another attractive area for investment. – Short-term investment potential lies in battery technology, particularly in assembly processes. – Opportunities exist in establishing solar-powered battery factories and DC charge networks. • Investing in battery recycling and the development of special lightweight materials presents a sustainable avenue for growth. • Many OEMs have invested in proprietary battery technologies, but new technologies and processes will evolve providing an opening for an automotive industry such as SA to have a value-adding battery value chain. Sodium-ion battery technology is one such example. This requires serious R&D and business and logistics planning. BYD has officially commenced construction on its first sodium-ion battery plant, marking a significant step towards diversifying the EV battery landscape. The move comes amidst growing interest in alternative battery chemistries. While lithium-ion batteries currently dominate the market, concerns regarding sustainability, cost, and resource scarcity have prompted industry leaders like BYD to explore innovative solutions. Sodium-ion batteries, with their abundant and readily available sodium resources, offer a promising alternative. Sodium batteries will be a low-cost solution that promotes the popularisation of mass electric vehicles.

Input Category	Stakeholder Inputs
Vehicles and Manufacturing	• There is a need for the South African government to broaden its recognition of New Energy Vehicles (NEVs) to include Hybrid Electric Vehicles (HEVs) and Plug-in Hybrid Electric Vehicles (PHEVs), not solely Battery Electric Vehicles (BEVs) and Fuel Cell Electric Vehicles (FCEVs). • Efforts should be made to identify practical challenges, address gaps, and engage with gatekeepers to formulate effective mechanisms for overcoming obstacles in NEV adoption. • To facilitate Electric Vehicle (EV) acquisition, support can be provided through leveraging financing partnerships and infrastructure collaborations. Additionally, incentives targeting EV usage within ride-sharing platforms like Uber, benefiting both riders and drivers, can further stimulate adoption. • Addressing challenges related to grid stability and reducing dependence on coal power generation are crucial steps in advancing the adoption of electric vehicles in South Africa. • Gauteng's provincial government fleet (GFleet) consists of 8 200 vehicles, across all different vehicles categories from motor bikes to HCV and construction vehicles. • Plans are underway to convert 8% to PHEV. • There is an investigation into hydrogen as an option. • There are exploratory talks around a H_2 refuelling facility close the GFleet's depot and in proximity of OR Tambo International Airport (ORTIA) with Gauteng Provincial Government owning land close to the airport. • As a fleet owner of bus fleets at airports (e.g. Ortia), ACSA (Airport Company South Africa) is investigating alternative energy solutions, e.g. H_2. To identify opportunities in this space, will require a bilateral discussion with ACSA. • The Aerotropolis development can serve as stimulus for NEV developments and is linked to the Tambo Springs proposed Truck Stop facility that can provide EV and H_2 recharging and refuelling facilities. To identify opportunities in this space, will require a bilateral discussion with ACSA. • Gauteng Provincial Government (GPG) is exploring a project converting MBTs to H_2 with reported interest to participate from the taxi industry. The pilot project is reported to be funded as a line item in the provincial budget. • We are an agency of provincial government (GDED)- not in industry. No production but development projects on NEV space and owner and operator of the Auto Supplier Park (Rosslyn). Mid-term budget allocated since FY 21/23. Pipeline of projects slowly gaining traction (project types = strategic, business park, micro mobility logistics). • The migration to NEV user uptake cannot happen without financing policies and mechanisms.

Input Category	Stakeholder Inputs
First –Mile-Last-Mile	• Considerations for transitioning existing ICE fleets to EVs hinge on cost-effectiveness, particularly examining Total Cost of Ownership, with EV adoption viable in select scenarios. This includes electric motorcycles, 3-wheelers, buses, and other fleet applications. • There is a good business model to use 2 and 3-wheelers for last mile deliveries, but with three key challenges: – The price of NEVs is impacted by elements like higher upfront costs, development costs of supporting infrastructure and technical challenges. – Practice relates to the critical need for operational excellence, with delivery being the crucial last step in delivering a high-quality customer experience. The electric transportation system must function properly to ensure it matches the needs of the delivery industry, for freelance drivers whose income depends on it. – Public acceptance is the sum of all parts of the electric mobility ecosystem coming together, connecting the dots between the different stakeholders, from consumers to drivers and from electricity providers to regulators, ensuring that electric mobility becomes the new normal. • The expansion of the "retail" market has pushed a notable increase in the total number of delivery vehicles on our roads and the frequency of their trips, leading to valid concerns about air pollution, missions, and congestion. • Up to 50% of the entire carbon emissions associated with delivery can be traced back to the last-mile phase. With no intervention, we can expect worldwide last-mile delivery demand to increase by 78% by 2030, resulting in a 36% rise in the number of delivery vehicles in the world's top 100 cities, with a consequent increase in emissions by 32%. • There seems to be a positive business case to electrify 2- and 3-wheeler vehicles for last mile delivery. If South Africa doesn't step in very soon to establish such assembly facilities for the domestic and African markets, there is a real risk that it may then happen is East Africa.
Software Systems and Technology	• Smart Mobility solutions encompassing Vehicle-to-Vehicle (V2V) communication and Advanced Driver Assistance Systems (ADAS) present significant opportunities. • Investments in Floating Car Data, Connected and Autonomous Vehicles (CAV), Transport Data Warehousing, Vehicle-to-Everything (V2X) communication, and Smart Payments systems for EV charging systems are areas of focus to be developed in the future. • Strategic investment in charging hardware and software is required to facilitate the integration of EVs into commercial fleets. This will enable a deeper understanding of energy requirements, enabling informed decisions regarding future fleet expansions and energy supply methods. • Utilising cloud-based technology enhances scalability and accessibility of software solutions. • Telematics and fleet management software offer opportunities for optimizing vehicle operations and logistics.

Input Category	Stakeholder Inputs
Infrastructure	• EVs present opportunities for field maintenance on network towers across the country, particularly in metro areas with higher tower densities and proximity to charging stations. However, operational requirements may necessitate ICE vehicles for towers in remote areas. • Investment opportunities encompass vehicle production and testing, including the development of supply chains and infrastructure. • Strategic investments include infrastructure development, battery manufacturing, and establishing Complete Knock-Down (CKD) plants. • Some stakeholders are currently focused on both CKD and Full Production Factory setups. • Investments in integrated charging infrastructure and renewable energy sources are crucial for supporting EV adoption. • OEMs are investing in bringing alternative energy vehicles into South Africa, involving the establishment of charging stations and dealership preparation to support them. • Additional investments are directed towards charging infrastructure, hardware and the Internet of Things (IoT), research and development, growth capital, partnership with external stakeholders like town planners, training, Software as a Service (SaaS), and Battery as a Service (BaaS) investments. • Other investments target depot infrastructure and in-house recharging facilities, covering the entire value chain from R&D, design and engineering, assembly, after-sales support, and charging infrastructure development. • The high level of crime in general and of cable theft in particular, is seen as a serious threat to recharging facilities.

9.2 Annexure B: Challenges

Input Category	Stakeholder Input
Batteries, Storage & Charging Infrastructure	• Meeting the charging requirements for commercial vehicles, which often demand higher capacities and more extensive networks than passenger cars, presents a significant challenge. • There is a notable lack of electric charging infrastructure suitable for heavy commercial vehicles such as trucks and buses, leading to poor availability and accessibility. • The price of batteries also poses a challenge, influencing the feasibility and scalability of charging infrastructure development. • A specific concern is EV battery production, which is largely situated in Japan, South Korea and China. • Opportunities exist to utilise the forecourts of ICE refuelling stations as charging stations.

Input Category	Stakeholder Input
Technology	• Accessing technology partners presents a challenge, crucial for staying abreast of advancements and innovations in the automotive industry. • South Africa, as a follower in the global automotive industry, faces challenges in local development due to the industry's ongoing state of flux. Transitioning to New Energy Vehicles (NEVs) necessitates clearer insights into emerging and immature technologies. • The transition from legacy technologies to electrical and digital ones poses significant challenges, requiring adaptation and upskilling. • Common components in NEVs, such as batteries and e-motors, are globally standardized for economies of scale, making localizing these high-value components for small-scale production challenging, akin to the challenges faced with Internal Combustion Engine (ICE) engines. • Adopting new technologies can be risky, with costly repercussions if they fail, underscoring the importance of careful consideration and investment. • Rapid technological advancements, changes in manufacturing techniques, components, and materials have substantial implications for the repair, maintenance, and recycling industries within the automotive sector. Addressing challenges related to re-skilling and capacity building is imperative. • Limited funding in a fast-changing environment necessitates efficient allocation to achieve results promptly, leaving little room for investment in transitional technologies. • The availability of 10ppm diesel across South Africa. • Identifying optimal locations for new EV charging infrastructure deployment poses a significant challenge.

Input Category	Stakeholder Input
Funding & Policy	• Government's lack of clarity and delays in pronouncing support frameworks hinder progress in the adoption of electric vehicles. • Absence of supporting regulations, such as high import duties on Heavy Commercial Vehicle (HCV) electric vehicles at 20%, and outdated road traffic regulations, inhibits the transition to electric vehicles and increases costs. • High taxes, currently at 42%, on electric vehicles exacerbate the cost barrier, discouraging market growth. • Slow market growth can be attributed to a lack of clear government communication about the importance of electric vehicles for the future. • The high costs associated with running a NEV pilot or demonstration projects, compounded by uncertainties regarding importing and duty taxes, necessitate significant initial funding to establish infrastructure and supply chains, hampering further investments. • Local manufacturers face challenges in competing with imported vehicles due to factors such as import taxes and lack of government subsidies or incentives. • Government support, including incentives, funding, and favourable legislation, is crucial for advancing the electric vehicle industry. • The absence of state subsidies outlined in the EV White Paper further exacerbates the lack of government support for electric vehicles. • Overall, there is a notable lack of government support in terms of both investment and incentives for electric vehicles. • The "first domino" to let many of the "pieces of the puzzle" fit into place is political will and leadership. • The current institutional fragmentation between government entities (such as DoT, DSI, DMRE, DFFE) is constraining faster and coordinated industry migration. • Policy clarity (delayed release of the DTIC NEV White Paper) and implementation of subsequent policies, now at least slowly resolving. • Lack of government support in terms of importing components we don't manufacture in SA. • Multinationals are struggling to navigate the morass of red tape.
Vehicle Demand & Cost of Ownership	• The lack of demand-side stimulation in the domestic market and the significant price differential between Internal Combustion Engine (ICE) vehicles and New Energy Vehicles (NEVs) hinder adoption. • In South Africa's socio-economic environment, the adoption of NEVs may be limited to those who can afford new vehicles of any kind, while ICE vehicles, even second-hand, remain the preferred choice for the average vehicle owner. • The high initial capital expenditure (capex) required for electric vehicles poses a significant barrier to ownership. • Import taxes on EV imports contribute to the overall cost, making electric vehicles less affordable. • High vehicle costs, compounded by excessive taxes, are perceived as unjustified, especially given the lack of perceived value addition from the government.

Input Category	Stakeholder Input
Vehicle Demand & Cost of Ownership	• The White Paper did not consider reducing import tariffs on EVs, which could significantly alleviate the upfront cost barrier, one of the most significant deterrents for potential buyers. • The average length of EV truck is 700mm longer to accommodate EV motors and batteries. • About 250,000 15 metre trailers are registered in South Africa, and this compounds the length problem. • Axle weight is problematic, especially for EV Trucks because one battery pack weighs 500 kilograms and a 6-pack are deployed on one truck, which adds 1.5 tons in weight. • Duty on imported Electric Trucks. • The price of an EV Truck is currently three times the price of a diesel ICE. • Volume is low and uptake slow because of uncertainty and power supply. • The range is 300 to 400 kilometres. • The financial benefit of an EV Truck purchase is realised in about year six due to the high upfront cost, using standard amortisation calculations. • Battery chemistry differs from OEM to OEM due to application considerations by each OEM. The technology is also evolving too fast for most local opportunities. • Battery cell material composition remains the confidential IP of battery manufacturers. • Battery swapping will not be possible at this early stage. • Assembly of batteries with imported cells. • Localisation of connectors, cables, casings, and other electronic parts. • Recycling of batteries. • Augmented reality training for emergency services and dealer maintenance technicians. • Charging infrastructure – AC Wall boxes (43kw) and DC charging stations (CCS2 – 250kw). • The uncertainty about residual value of NEVs and the apparent low used-car market and low prices are obstacles for NEV uptake. • Localising New Energy Vehicle (NEV) components faces challenges in attracting multinational component suppliers due to the lack of economies of scale. • South Africa's degraded infrastructure and poor economic conditions pose significant challenges to the development and adoption of electric vehicles. • The low initial volume requirement for high-cost investments and research presents a barrier to entry into the electric vehicle market.

Input Category	Stakeholder Input
Vehicle Demand & Cost of Ownership	• Legislated targets to ban new sales of Internal Combustion Engine (ICE) vehicles in South Africa's main export markets pose substantial challenges to the domestic automotive industry. Navigating this transition requires balancing global trends, maintaining competitiveness in the NEV market, and mitigating economic and employment risks associated with declining demand for traditional ICE vehicles. • The transition to NEVs necessitates re-skilling and capacity building, covering both the current workforce and the next generation of employees, including highly skilled staff in Research and Development (R&D) and new materials. • Load shedding in South Africa, resulting from electricity supply shortages, further exacerbates economic challenges, impacting industries including automotive manufacturing and electric vehicle adoption.

9.3 Annexure C: Recommendations to address challenges

Input Category	Stakeholder Input
Knowledge and Skills Development **(Note:** (1) It has since been announced that South Africa aims to set up three JET-IP aligned skills development zones (2) The National Business Initiative (NBI), together with the Presidency's JET project management unit (JET PMU) and Boston Consulting Group, have launched the JET Skilling for Employment Programme (JET SEP)	• Establish a unified national strategy for New Energy Vehicles (NEVs), engaging all stakeholders including government entities, research bodies, industry associations, and private sector companies to develop a comprehensive NEV roadmap. • Prioritize research efforts and access to better data to inform decision-making and strategy formulation within the NEV sector. • Develop business cases for specific NEV applications, such as field operations for telecoms, to demonstrate their viability and benefits in various industries. • Adopt a phased approach to NEV implementation, starting with small-scale projects to learn and understand NEVs, followed by comprehensive project planning with infrastructure development as a primary focus. • Advocate for the implementation of recommendations from industry committees, such as those made by the NAAMSA HCV NEV committee, by relevant government departments like the Department of Trade, Industry, and Competition (DTIC) and Department of Transport (DoT). • Facilitate changes to local legislation to accommodate NEVs, such as adjustments to weight and length restrictions, and explore duty-free import windows to stimulate NEV market growth. • Foster Public-Private Partnerships (PPPs) to expand charging infrastructure, preferably powered by renewable energy sources, to achieve carbon-neutral transportation goals. • Revise bus contract models to accommodate the dynamic nature of NEV technology and ensure the sustainability of bus fleets as major NEV users. • Outline clear programmes for carbon financing, integrating them into Just Energy Transition initiatives, particularly when leveraging mobility technologies like Mobility as a Service (MaaS) and car-sharing schemes, supported by robust policy frameworks. • Seek expertise and insights from institutions like the Council for Scientific and Industrial Research (CSIR) to inform decision-making and policy development in the NEV sector. • The technical skills system is in shambles while there is a massive emerging need for skills along the value chain. • There are no successful pilot projects that demonstrate retrofitting as an option, aggravated by the lack of budgets in Metro and Provincial Government entities. • Implement consistent training programs to increase awareness among individuals involved in operating electric vehicles, focusing on aspects such as charging point utilization and efficient delivery route planning. • Develop an EV certification programme for skills development.

Input Category	Stakeholder Input
Policies	• Develop policies aimed at attracting international partnerships for local manufacturing of New Energy Vehicles (NEVs), fostering collaboration and investment in the sector. • Government clarity on NEV policy support frameworks is crucial to kickstart the transition to NEVs. Implementing recommendations from jointly funded research studies, such as the NAAMSA DTIC NEV research study, can stimulate demand and encourage local manufacturing of EVs and EV components. • Addressing corruption and mismanagement is essential for improving spending efficiency and enhancing economic prospects, laying a solid foundation for sustainable growth. • Promote local manufacturing and reduce import duties and ad valorem taxes to incentivize domestic production and support the growth of the NEV industry. • Prioritize locally manufactured products and consider dropping ad valorem duty, taxing vehicles and batteries separately to encourage local production and investment. • Reform policies related to import duties and incentives to create a favourable environment for NEV adoption and local manufacturing. • Introduce incentives such as reduced import duty on fully imported EVs, contingent upon local investment by the importer, to encourage local industry development. • Expand NEV policy development to include Hybrid Electric Vehicles (HEVs) and Plug-in Hybrid Electric Vehicles (PHEVs), ensuring comprehensive support for diverse NEV technologies. • The NEV White Paper should provide clear government thinking and long-term implementation plans, serving as a strategic framework for the industry's growth. • Supply side policies are progressing; we are pushing for more demand side stimulus. We have projects aimed at addressing Government fleet policy. • From our supplier park side, we aim to provide safe near-site locations for potential new NEV tier 1 's in Rosslyn. The AIDC founded TASEZ in Silverton to similarly support tier suppliers to Ford. Inbound logistics (KD components) remains a challenge which will become more critical for NEVs. • Re-rate the taxes for components. • Understanding of grades of raw materials required, the IP and technology associated with production and raw material beneficiation identification and determine holders, understanding the skills required for the NEV transition and developing a pipeline to support the skills requirement. • Speculative investment from DFIs or government departments is required. Identifying the most practical and in demand location for this speculative investment into infrastructure is also key. Perhaps a few SEZs should be earmarked and each of them funded for a feasibility study. • Implement main highway power infrastructure at existing petrol stations. Allow private sector to bid for infrastructure on all other roads.

Input Category	Stakeholder Input
Policies	• Accelerate the diversification of energy sources and implement investment incentives to facilitate decentralized access to the grid, including support for battery swapping installations. • Align government tenders with NEV strategies, prioritizing pilots, and local innovation to drive industry growth and technological advancement. • Stabilise the national grid to mitigate losses and provide reliable energy. • The lack of, or delayed decisions, on National Government level has disproportionate impact on investment decisions. • The perceived lack of political will across all Government Departments to provide significant "push" for NEV must be addressed urgently. • The Budget Speech is not compelling and detailed enough to create a sense of coherence. Need a clear and comprehensive political statement on how the full NEV value chain will unfold. • We need clarity and greater detail on how policies will unfold. • Incentives need to be customised for different sub-sectors. • A successful NEV migration requires a perspective for the full NEV ecosystem, not just manufacturing and charging infrastructure. • Until the national grid is stable and reliable, NEV uptake will be severely constrained with some reliance on off grid charging. • Temporarily reduce import duties for batteries in vehicles produced and sold in the domestic market. • Secure or maintain duty-free market access for vehicles and components produced in SA. • Leverage R&D tax incentives to deepen domestic value addition. • Commercialise green hydrogen production as a sustainable fuel. • Implement and speed up energy reforms. • Implement reforms to network industries, freight, rail, and ports. • Refurbish the rail line between Gauteng and Ngqura.

Input Category	Stakeholder Input
Investments	• Invest in the development of refuelling infrastructure to support the adoption of New Energy Vehicles and ensure their widespread accessibility. • Encourage investment corporations, banks, and government entities to adopt and invest in NEV technology early, incentivizing importation, localisation, and tax incentives to stimulate market growth. • Increase investment in infrastructure development to support the NEV market in South Africa, making localisation efforts economically viable. • Ensure the presence of essential infrastructure such as functional ports, railways, and reliable electricity availability to competitively build vehicles in South Africa, whether they are ICE or NEV. • Establish a battery manufacturing facility in South Africa to support local NEV production and reduce dependence on imported components. • Consider lowering import duties temporarily to encourage investment and stimulate demand, while investing in local battery manufacturing to reduce costs and support the production of stationary storage and NEVs. Additionally, explore partnerships with Chinese EV manufacturers to establish manufacturing plants in South Africa, further reducing vehicle costs and promoting local production. • Investment in production facilities has the potential to significantly expedite market growth. To address challenges in South Africa's autogas industry, including the need for conversion centres and refilling stations primarily targeting fleet operators, several strategic steps can be taken. This includes advocating for government support and incentives, fostering public-private partnerships, and launching awareness campaigns to promote the benefits of autogas. Financial assistance programs, incentivising fleet conversions, and supportive regulatory frameworks can further facilitate infrastructure development. Additionally, investing in technology advancements to enhance conversion and refilling processes is crucial. By implementing these measures, industry stakeholders can overcome hurdles, stimulate demand, and accelerate the adoption of autogas as a sustainable transportation solution in South Africa.

9.4 Annexure D: International component partnerships

Input Category	Stakeholder Input - Some observations
International Partnerships	• Beneficial for international collaborators (or partners) to cost R&D in ZAR rather than in USD or Euro. • There is potential in partnerships with international parent telecom companies, or local partnerships between telecoms operators and EV OEMs. • We have been in contact with German partners and some Belgian companies, with the potential for partnerships expressed. • Import electric vehicle skateboard platforms and manufacture vehicle bodies locally to save costs. • Most of the fundamental technologies of new BEV are not locally manufactured in South Africa and therefore would require an international partner to setup and help develop these skills, as the skills required are completely different than with ICEV, for instance the battery packs. • All the manufacturers are international – the South African entities need to cooperate with them. • We have already engaged with 2-wheeler and 4-wheeler manufacturers and battery manufacturers in China. Our project requires international investors/ partners, there are similar businesses in other parts of the world, which are understood better by these investors. Currently I feel local investors/partners are too sceptical and don't truly understand the potential that is on the table. We plan to bring these skills to South Africa through these partnerships. • NEV components are common / modular across several vehicle platforms. The EoS is not there to localise these. The EU has for example softened anti-competition laws to allow support of battery production in Europe. The combined SA automotive industry is not big enough to challenge the investments made in the EU and other regions. • As an international OEM, we already have many international partnerships. We would like to see where we can facilitate in expanding local capacity to support and build EV's. • Local companies are working closely with international companies for localisation. • We have strong international partners that deploy solutions based in their incentive schemes. • We have partnered with international OEMs and component manufacturers.

Input Category	Stakeholder Input - Some observations
Local Challenges	• Need to attract multination EV component suppliers and localise subcomponents which will take a long time as volumes and scale are lacking in SA and SA is already behind the global trends. • The SA transport environment (the same in many respects), differ widely in others, and localisation is critical for success. • The SA market is big and has a gatekeeper called the taxes. If we can do local production, it would make EVs more affordable. • Shortage of skills/ experience/ funding prevent being a leader, but rather a follower - need for international partnerships. • The country is not yet tooled up for manufacture of components, outside help is required. • We don't produce locally. • Without a local EV manufacturing operation, components won't make economic sense.
Local Opportunities	• NEV sub-componentry with high localisation potential include electric motors and transmissions (e-axle); power electronic sub-components such as PCB assemblies and housing; and high-voltage electrical distribution components such as wire harnessing. • Manufacturing autogas tanks and bulk storage tanks can feasibly be localized with dedicated engineering and design initiatives. Additionally, with focused efforts, the manufacturing of all other components required for both autogas vehicle conversions and refilling infrastructure can also be localized. • We can leverage the power of the Uber platform to pilot new cars on the road and accelerate early testing phases. • We already working with international partners but would be very interested in finding a network developer that is interested in co-investing in SA. • A well-established component manufacturing industry already exists. It should not be too much of a challenge to extend its capability. • The Atlantis SEZ is well networked with cluster organisations like the international Cleantech cluster providing easy access to international investors and/or markets. They ASEZ also has its own network of foreign investors who continue to engage on the potential to locate therein. In addition, the healthy relationship with InvestSA and Wesgro provides additional access through investment promotion and marketing of the ASEZ zone. • Fully capable to train and upskill South Africans to work in the NEV manufacturing sector. • Current component manufacturers are already international companies or JVs – a trend that will most likely intensify (viewed as a suppler park and developmental organisation).

9.5 Annexure E: Technology partnerships

Input Category	Stakeholder Input
R&D	• R&D is in its infancy in South Africa. • SA R&D in the automotive industry is minimum. • Break-through technologies mainly from parent companies. • Much of the core technologies are developed by holding companies, with localisation and "fit for purpose" modifications locally made for the SA environment.
Local Technology Opportunities	• The core technologies are developed by the parent company -- local opportunity to customize for SA and Africa conditions. • What we would be good with is finding innovative ways of deploying these technologies in the local context (i.e. make a plan). • Lots of potential to pilot experimental IP in South Africa. • We have already started development on our software systems (PaaS and SaaS) we are partnering up with an international company and localising this in the coming months. • As HCV manufacturer our philosophy is to keep all manufacturing in house. • We can leverage the power of the Uber platform to pilot new cars on the road and accelerate early testing phases. • Access to the International Cleantech Network and local industry allows for a great understanding of what is required from a technology point of view. Companies like Rubicon also have international links to companies who are active in the EV space. GreenCape is also significant partner with the ability to aggregate both local technology providers as well as, in some cases, international. • SA needs to stand out to be considered for the huge investments and government dragging its feet with clarity on support framework to transition to NEVs. • We want local to be given priority. • We have strong international partners that deploy solutions based in their incentive schemes. • Will be key to the AIDC (for Potential projects), already collaborating with similar developmental organisations in more mature NEV markets. • We are constantly looking at partnerships with Global entities. • We have qualified engineers ready to assist international companies.

Input Category	Stakeholder Input
Local Technology Challenges	• According to our internal research we believe South Africa is 12 years behind on technology development for NEV, thus it will take too long to do technology development from the start. However, we do envision an approach to localize as much as possible of the technology development. • South Africa is too low in the value chain in terms of technology developments, both in terms of the EV value chain, battery value chain, charging station value chain, and too small to drive competitive scale. • The complexity, cost, risks, and dynamic interrelationships in technology development will make SA more of a collaborator than a leader. • Not sure the industry is technologically well enough resourced to be attractive, and not sure the current state of the nation is likely to attract or retain the appropriate resources. • Technology will not be developed locally, but rather centrally. • When we have economies of scale, we have a massive opportunity to prove EVs in Africa and South America. • The biggest technology challenge is development is happening faster than planning, testing and against set standards and specifications. • Technology solutions are available at competitive prices. • We have no VCU or electrical component manufacturer.

9.6 Annexure F: Additional Comments

Input Category	Stakeholder Input
Shared Vision and Road Map	• We need a shared vision/road map for NEV transition to be successful and efficient. There are too many stakeholders -- in private sector, R&D/Universities as well as multiple Government Departments that are not engaging with one another. The task is too large and complex to achieve the desired outcome without an integrated effort. • Since NEV's is new technology / requires different thinking and requires complex aggregates (infrastructure/ digitalization/ etc.) a work group involving industry role-players could be an effective methodology to do things right from start to end. • Incentivizing electric vehicle adoption. • NEV migration is curtailed by fragmentation across stakeholders, each progressing without clarity on where the county is, or should be going. • Too much fragmentation to move forward with any degree of urgency. • A flexible approach to NEV technologies by not excluding HEV and PEV will offer many advantages to SA's NEV migration and support local initiative across a wide spectrum, such as reduced carbon emissions, infrastructure flexibility, local industry development, technology transfer and skills development and growing market demand. • An example of collaboration is the BMW pilot Hydrogen fuel fleet. BMW is rolling out a pilot fleet of BMW iX5 Hydrogen fuel vehicles in SA in partnership with Anglo American Platinum (Amplats) and Sasol. This integrates diverse experiences and skills sets and improves the probability of successful outcomes. • Another potential collaborative opportunity lies in a cross-border initiative utilising the African Continental Free Trade Area (AfCFTA). The first batch of locally produced goods to be exported under the framework left Durban harbour beginning 2024, signalling the start of preferential trade as a single market on the continent. The AfCFTA creates the world's largest free trade area by number of countries and has the potential to be a catalyst for the transformation and growth of African economies and businesses. • AfCFTA aims to eliminate trade barriers, including tariffs, to boost intra-African trade, while growing value-added production and trade across all sectors, providing exporters with new opportunities to access markets. It is hoped that the framework will accelerate development of regional and local value chains, offering investors access to a population of more than 1.3-billion people, of whom more than 60% are under the age of 25, according to the World Economic Forum, and with a fast-growing continental GDP. In its full iteration, the framework has the potential to enable the development of regional automotive hubs, as well as expediting exports into African markets.

Input Category	Stakeholder Input
Shared Vision and Road Map	• The Atlantis Special Economic Zone is well positioned to locate and grow a NEV industry through development of a cluster in the SEZ. The Western Cape and Cape Town are very dominant forces in the NEV space, as many of the NEV companies and components associated thereto, are manufactured/assembled in the area. A significant opportunity to grow this industry through clustering exists, as engagements with companies in the ecosystem all point to the ability to work together, share learnings and transact seamlessly. The physical proximity to each other has other benefits too and this is something that should be explored. Existing NEV companies scattered throughout a region, brought together near catalyse rapid growth of this industry.
Policies and Incentives	• Government is still the biggest hurdle with tax and can encourage investment through tax breaks. • NEV is neither a threat nor the saviour of automotive production in SA. The challenge of energy availability, poor availability of critical skills, poor infrastructure is common to ICE and NEV. Promoting NEV sales in SA will not have any impact on EoS as even converting all local sales to NEV will still constitute a small fraction of volume required for economical local production. • If government provided investment or support this industry could thrive in Africa. • To develop a local cell and battery production industry requires policy support to incentivize investments, streamline regulatory processes, and ensure alignment with broader economic and environmental goals. • To support the transition, incentives accommodate the distinct needs of export-oriented manufacturers and those focused on local consumers. A balanced approach that supports both export oriented and local consumption focused manufacturers is essential. A harmonised incentive framework will contribute to the overall success of the automotive industry's transition to alternative drivetrains. It has become abundantly clear that the current APDP is insufficient to support BEVs even with 60% exports and furthermore insufficient with an OEM that prioritises the SA market over exports. • Regrettable that Plug-in Hybrids and Fuel Cells are still excluded from the scope as it is likely to constrain consumer uptake. • Current policy direction affects non-export focused OEMs negatively. • With incentive programme scheduled to come into effect only in 2026, investment decisions/announcements will be postponed till then. • It seems we may have a too close affinity for traditional OEM's that currently supports SA manufacturing and do not want to disturb the status quo. We wait and wait for action and are falling further behind other Southern African countries like Rwanda, Kenia and Uganda in the rollout of NEVs. • Migration cannot wait till national grid is stable and urgent investment is now needed to upscale the supply of renewables

Input Category	Stakeholder Input
Policies and Incentives	• SA will struggle to become a centre of EV manufacturing excellence when we are so slow to response to trends that develop overseas. • It is concerning that the incentive announced in the Budget Speech appears to be exclusive to vehicle manufacturers, leaving component manufacturers without the same opportunity. To transition to the new EV technologies, investments need to be made across the entire value chain in the South African auto industry. SA's competitive advantage may lie more in the component element of the auto value chain. It is also where there are the greatest opportunities for job creation. • The seven OEMs based in SA have increasingly divergent business models and regulatory needs. Some, like BMW and Mercedes-Benz, are principally exporters. Toyota, in Durban, runs a line aimed at the local market (Hilux, HiAce, Corolla Cross) and exports. Ford (with the Ranger bakkie) and Volkswagen both need a local market to make their business models work. The manufacturers seem to agree that without some kind of market support here in SA to drive local demand, the transition to electric motoring in SA is a distant idea, and that in turn will make EV manufacturing a difficult sell at head office.
Opportunities	• Please insist on local manufacturing for EV chargers to be given support and priority. • The SADC region has the world's highest concentration of raw materials to manufacture battery cells. In addition, we are a nation who build automobiles. Yet we do not manufacture battery cells. • EV's will never be able to scale without a stable grid or affordable batteries. Both FCEV and HEV requires a massive surplus of electricity production and battery storage. • The transition to assembling NEVs must be accompanied by the domestic components industry acquiring a range of NEV technological capabilities that permit continued growth of local content in domestically assembled vehicles. • With battery technology becoming more stable and an increasing number of recharging stations, consumer perceptions currently favouring hybrids is likely to become more in favour of full BEV, making it a matter of choice between BEV and PHEV. • Africa has potential future market, but is price sensitive, worth exploring Last-Mile NEV vehicles in conjunction with SA market potential.
Purchase Price Parity	• The SA car park has approximately 11 million vehicles and large-scale adoption of NEV will occur when "effective parity" is achieved with some metrics (e.g. range, TCO, quality and user experience) to be progressed with. • The total cost of ownership can pivot NEV adoption for fleets, but it is unlikely to sufficiently encourage private car buyers.

Input Category	Stakeholder Input
Energy	• The cost of electricity at way above the inflation rate and its supply/cost uncertainties undermine migration planning. Without massive upgrades to the nation and localized grides, the NEV migration cannot be supported. • For private sector-funded recharging infrastructure to make sense, there needs to be sufficient volume. • There is likely to be a strategic shift on the energy spectrum. Currently coal is being shifted from Mpumalanga to Gauteng and Western Cape to be later reversed with renewable being shifted from the Western and Northern Cape northwards. There are huge benefits to shifting from imported energy (such as crude specifically) to domestic energy resources. • A significant challenge lies in meeting the on-route charging needs of Heavy Commercial Vehicles (HCVs), ensuring they can charge quickly within an hour. • Fleet owners must put mechanisms in place to re-plan routes and charging points and re-train drivers to different vehicle characteristics. • Hydrogen doesn't yet offer a viable option, and battery technologies are likely to improve. • In addition to the work of the Automotive Desk of the DTIC, the Green Energy Desk is also developing plans to encourage various "green industry" initiatives, including deepening the Last Mile 2- and 3-wheeler industry.
Vehicles	• The increased length and weight of BEV HCV and XHCV is a challenge. • The value of HCV and its load require secure recharging facilities. • With the collapse of rail, both freight and passenger, road transport is by far the biggest user of diesel. Of the approximate, 14 billion liters of diesel consumed per year, 8 billion liters are used in the commercial sector, 4 billion liters for road transport, 1 billion in mining and agriculture and construction combined consume a further 1 billion liters of diesel. In quarrying and open pit mines to a degree, draglines are used. Underground mining operations make extensive use of electric vehicles, shuttles and conveyor systems. • The use of renewable fuels in ICE vehicles in moving towards zero emissions must be explored. • The Minibus-Taxi industry moved during past 5-7 years from petrol to diesel based on total cost of ownership benefits and during next 3-odd years 90% of taxis will be on diesel because it makes good business sense. • For MBT to migrate to NEV, several challenges must be addressed, such as: Political, Cultural, Operational/Technical, Skills ("Township Mechanics").

9.7 IDC NEV Stakeholder Engagement Questionnaire

IDC NEV Stakeholder Engagement

Dear Stakeholder

The IDC has commissioned AIH Consulting to conduct a New Energy Vehicle (NEV) Value Chain Study. Click here to read the IDC's letter requesting stakeholder participation.

The aim of the study is to inform policies and identify potential investment and other opportunities.

We greatly appreciate your assistance with the requested information below which should only take just 5-8 minutes.

Please provide your information in the form below. All responses will be collated and represented in an overall manner without identifying respondents.

Thank you in advance.

OWEN SMITH

Project Leader

Company

_____

Name

_____

1. Industry Readiness

How would you rate your industry's readiness to transition towards New Energy Vehicles (NEVs)?

(Least ready) (Most ready)

○ 1 ○ 2 ○ 3 ○ 4 ○ 5

2. Investment Plan

What are your company's investment plans regarding Internal Combustion Engine vehicles and New Energy Vehicles?

	No investment planned	Investment in the next 1-5 years	Investment in the next 5-10 years
ICE vehicles			
NEV vehicles			

Please specify identified opportunities for investment in your sector, should you plan to invest.

3. Practical Challenges

Rate how the following challenges may impact your business with regards to New Energy Vehicles.

	No challenge	Slight challenge	Moderate challenge	Severe challenge	Highest challenge
Infrastructure					
Cost of manufacturing/ ownership					
Cost of transitioning to NEV					
Lack of investment					
Lack of supporting supply chain					
Lack of supplier network					
High impact costs					
Infrastructure					
Cost of manufacturing/ ownership					
Cost of transitioning to NEV					
Lack of investment					
Lack of supporting supply chain					
Lack of supplier network					
High impact costs					

4. Potential International Partnerships

NEV component localisation: rate your potential for international partnerships?

(Least likely) (Most likely)

1 2 3 4 5

Please elaborate on your previous answer.

NEV technology development: rate your potential for international partnerships?

(Least likely) (Most likely)

1 2 3 4 5

Please elaborate on your previous answer.

5. Additional comments

Do you have any other comments you would like to make?

10. PROJECT TEAM

10.1 Project lead

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10.2 Contributing Authors for the Study Phase 1

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