GreenCape

Sustainable Mobility Market Analysis and Opportunity Report

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1 Executive Summary

As South Africa moves towards a Just Energy Transition, where greater investments in clean, renewable energy will replace traditional coal power plants, there is an opportunity to also transition the mobility sector from a reliance on the Internal Combustion Engine (ICE) vehicle to zero-emission electric alternatives.

According to the South African Petroleum Industry Association (SAPIA), South Africa is currently a net importer of fuel in 2022, amounting for 60% of demand. The country's refining capacity has been steadily decreasing due to aging local refineries which have slowed or stopped production due to global and domestic shifts in policy, supply constraints, rising production costs and unfavourable economics.

The transition to zero-emission electric vehicles (EVs) in South Africa is therefore of strategic national economic importance due to the potential savings for South Africa's National Balance of Trade. This is in addition to the reduction in direct greenhouse gas (GHG) emissions that must be achieved to meet the country's National Climate Commitment under the Paris Agreement. South Africa intends to limit GHG emissions to 398-510 $MtCO2^e$ by 2025, and to 350-420 $MtCO2^e$ by 2030 according to the latest National Climate Commitment released in September 2021.

As the South African Renewable Energy Masterplan (SAREM) and Renewable Energy Independent Power Producers Procurement Programme (REIPPPP) is rolled out in the years to come, the influx of clean renewable electricity supply onto the national grid will slowly improve the corresponding grid emission factor with regards to electric vehicle uptake and subsequent charging demand.

EV car sales in South Africa have been steadily rising after a brief dip in 2020 due to the global Covid19 pandemic. In 2021, 218 electric passenger vehicles were sold consisting of BMW, Mini Cooper, Porsche, Jaguar and Audi. In the same year two battery electric BYD buses were purchased by Golden Arrow Bus Services for pilot testing. This growth in EV sales while small will continue to grow as more battery electric OEMs enter the South African market. In addition, rising fuel costs have created a financial strain on consumers which if left unabated will accelerate EV adoption in South Africa.

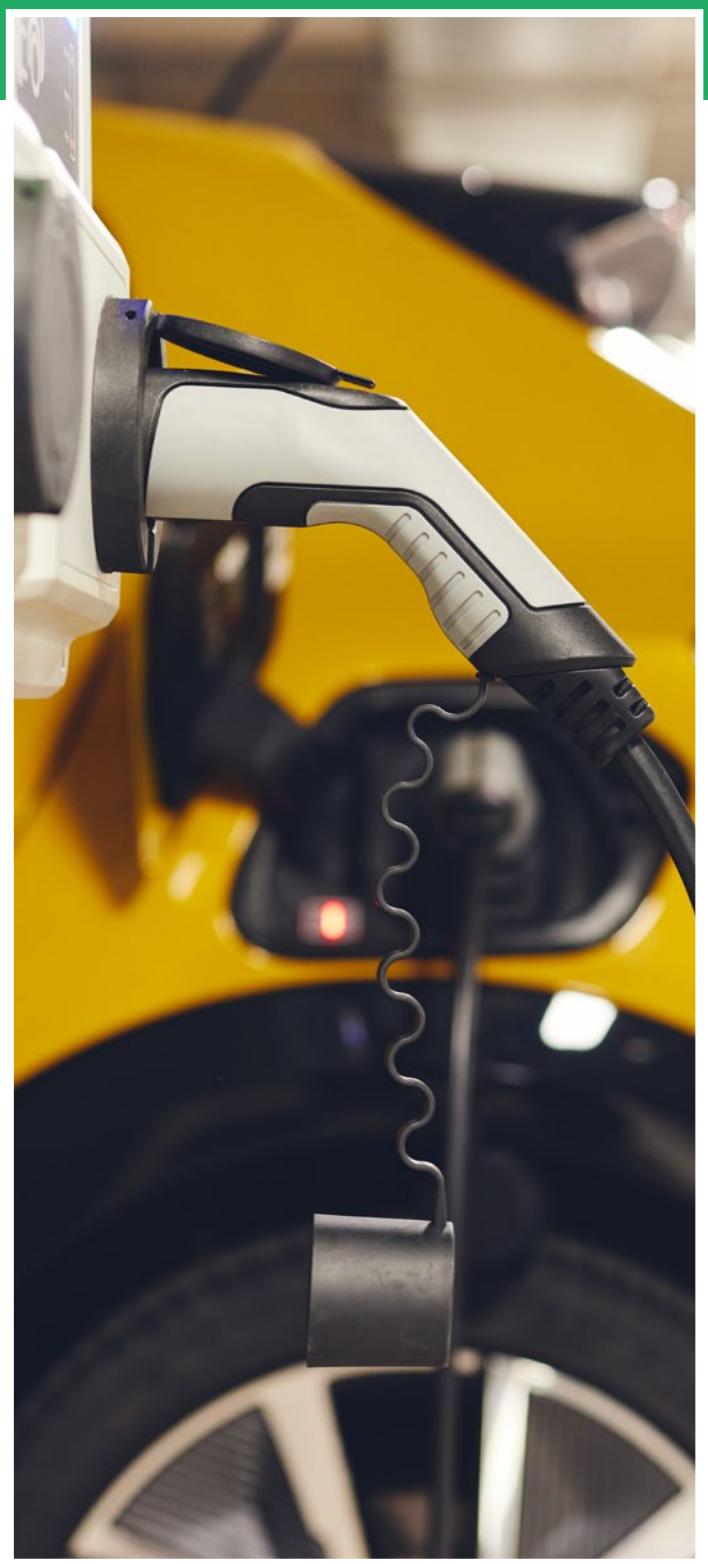
There is currently an 18% tax that is levied on imported ICE vehicles in South Africa, which has been put in place to protect the local automotive manufacturing industry. EV imports are taxed at 25% with a further Luxury Goods Tax (Ad Valorem) added of up to 17%. This contributes to an overall tax rate of at least 42% on EVs imported into the country. This presents a major barrier with regards to increasing EV uptake in the local market. There is an opportunity for investment in electric vehicle manufacturing at the Atlantis Special Economic Zone for green technologies (ASEZ) to lower the cost of ownership of EVs due to the avoidance of the import and ad valorem tax.

Public Transport vehicles such as buses and taxis are designated by the Department of Trade, Industry and Competition (dtic) meaning that these vehicle types require 80% locally manufactured components such as vehicle body. This represents a strategic market opportunity which can be used to establish an electric vehicle manufacturing industry at the ASEZ with a potential market size of 350 000 minibus taxis and 65 000 buses.

Further, South Africa's automotive manufacturing sector (ICE) exported just over 60 percent of the 447 218 vehicles that were manufactured in South Africa in 2020. The UK imported the most South African cars accounting for 67 798 units in 2020 and 101 401 units in 2019. The UK is followed by Germany, with 25 736 units imported from SA in 2020, Japan (23 645), France (13 956), Australia (13 041), Italy (10 456), Belgium (10 048), USA (8 584), Netherlands (8 321) and Austria (6 376). This export market is now threatened by the ban on the sale of ICE vehicles in the UK (2025) and European Union (2030). This is significant driver for attracting EV manufacturing investment to the ASEZ.

2 Introduction

The vision of the ASEZ is to become a hub for the manufacturing of green technologies. The Western Cape has traditionally not had an automotive assembly industry of the scale that currently exists in Gauteng, the Eastern Cape and KwaZulu-Natal. In order to attract EV manufacturers, the ASEZ requires the implementation of innovative policies, tax and other financial incentives and investment in the required infrastructure.



2.1. South African EV policy environment

There is currently an 18% tax that is levied on imported ICE vehicles in South Africa, which has been put in place to protect the local automotive manufacturing industry. EV imports are taxed at 25% with a further Luxury Goods Tax (Ad Valorem) added of up to 17%. This contributes to an overall tax rate of at least 42% on EVs imported into the country. This presents a major barrier with regards to increasing electric vehicle uptake in the local market. There is an opportunity for investment in EV manufacturing at the ASEZ to lower the cost of ownership of electric vehicles due to the avoidance of the import and ad valorem tax.

Public Transport vehicles such as buses and taxis are designated by the dtic meaning that these vehicle types require 80% locally manufactured components such as vehicle body. This represents a strategic market opportunity which can be used to establish an electric vehicle manufacturing industry at the ASEZ with a potential market size of 350 000 minibus taxis and 65 000 buses. Further, the South African Minibus Taxi Recapitalisation Programme represents an opportunity to make use of national government funding from the Department of Transport to formalise, reform and electrify the minibus taxi industry. This would be a promising opportunity to usher in a just electric mobility transition which would benefit the most vulnerable members of South African society.

Under the current minibus taxi recapitalisation programme, the scrapping of old and un-roadworthy minibus taxi vehicles, that were manufactured on or before 4 September 2006, qualify for a subsidy on a new vehicle in the form of a scrapping allowance. A scrapping allowance of up to R133 500 per minibus taxi is claimable from Taxi Recapitalisation South Africa. This scrapping allowance could in future be directed towards electric minibus taxis only once the market has matured and there is enough supply to meet this potential demand.

2.2.
EV uptake policy in South Africa

The South African Green Transport Strategy aims to set a path towards the decarbonisation of the country's mobility system to achieve a 5% reduction of GHG in the transport sector by 2050. Whilst the strategy proposes of number of technologies including biogas, hydrogen fuel cell and battery electric, market availability, technology readiness and energy source availability has made battery EVs the most promising solution in the short to medium term.

The Western Cape Government Electric Vehicle Strategy was published with a goal of electrifying the provincially owned Government Motor Transport (GMT) fleet. A set of specific targets to be achieved by March 2025, includes a target stating that 2.5% of the provincial fleet must be zero-emission EVs. The current number of vehicles in the Government Motor Transport fleet amounts to approximately 7 000 vehicles and electrifying 2.5% of that fleet size would equate to approximately 175 EVs which must be procured by 2025. Lastly, the City of Cape Town is also planning for fleet electrification with feasibility studies being undertaken for the MyCiti Bus Rapid Transit as well as the City Fleet department. City Fleet has previously run a pilot project with BMWi3 vehicles for the traffic department and will use the data collected to guide future EV procurement processes.

2.3.
South African EV export market opportunities

South Africa has a number of free trade agreements in place which would support the growth of an EV manufacturing industry at the ASEZ to supply the growing global EV export market. The USA and South Africa have signed the African Growth and Opportunity Act (AGOA) which provides duty free market access to the United States for South African manufactured vehicles. The European Union and South Africa have the EU-South Africa Free Trade Agreement in place, however there is current negotiation regarding EV import duties. Lastly, there is the African Continental Free Trade Area (AfCFTA) will provide a duty free electric vehicle export market into the African continent. This free trade agreement is particularly important with regards to the export of electric minibuses and buses into the African market.

2.4.
South Africa EV market sizing

According to the Auto Green Paper on the Advancement of New Energy Vehicles in South Africa, the following EV sales were recorded per year from 2016 to 2021 as shown in the table below:

Table 1: Table Showing EV sales in South Africa per year

ELECTRIC VEHICLE SALES IN SOUTH AFRICA	2016	2017	2018	2019	2020	2021
	100	68	58	154	92	218

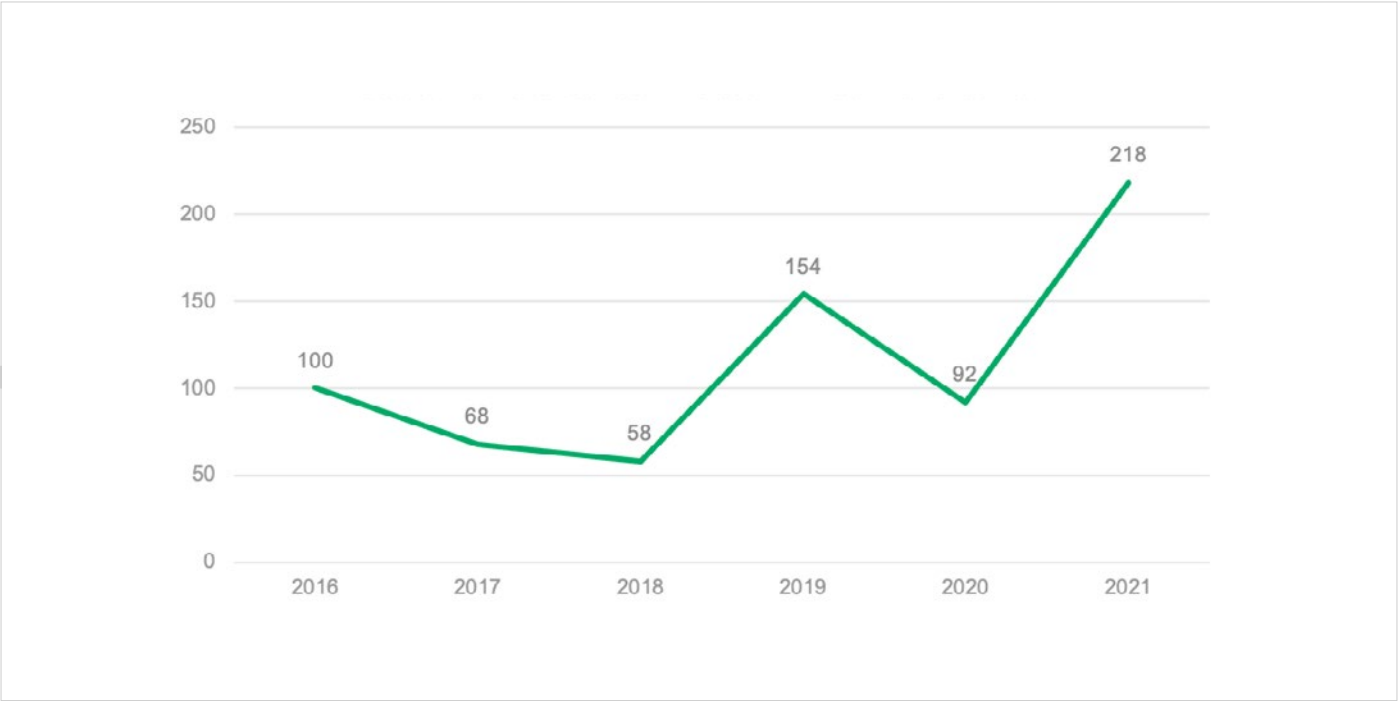


Figure 1: EV sales in South Africa per year from 2016 to 2021

A breakdown of the number of EVs sold in South Africa in 2021 by brand is shown in figure 2: The highest selling EV was the Mini Cooper SE at 68 vehicles, followed by the BMW iX at 63 vehicles, the Porsche Taycan at 33 vehicles, the BMW i3 at 20 vehicles, the Jaguar i-Pace at 19 vehicles and the Audi E-Tron at 15 vehicles. It has however been confirmed by BMW that they will end production of the BMW i3 in June 2022.

Of these companies only BMW currently has a manufacturing plant in South Africa based in Rosslyn, Gauteng. There is an opportunity for the ASEZ to approach Mini Cooper, Porsche, Jaguar and Audi to set up EV manufacturing facilities in Cape Town due to the evidence of sales of these brands in the South African market. In addition, the ASEZ could position itself to become an important component supplier to the BMW plant in Rosslyn by becoming a first market mover in a strategic element of the EV value chain such battery cells.

The potential EV market size in South Africa has been estimated using the live vehicle population data from eNatis for September 2021. This data shows that the largest market segment is the private passenger motor car at approximately 7.6 million vehicles. This is followed by the light delivery vehicle segment which is around 2.7 million vehicles.

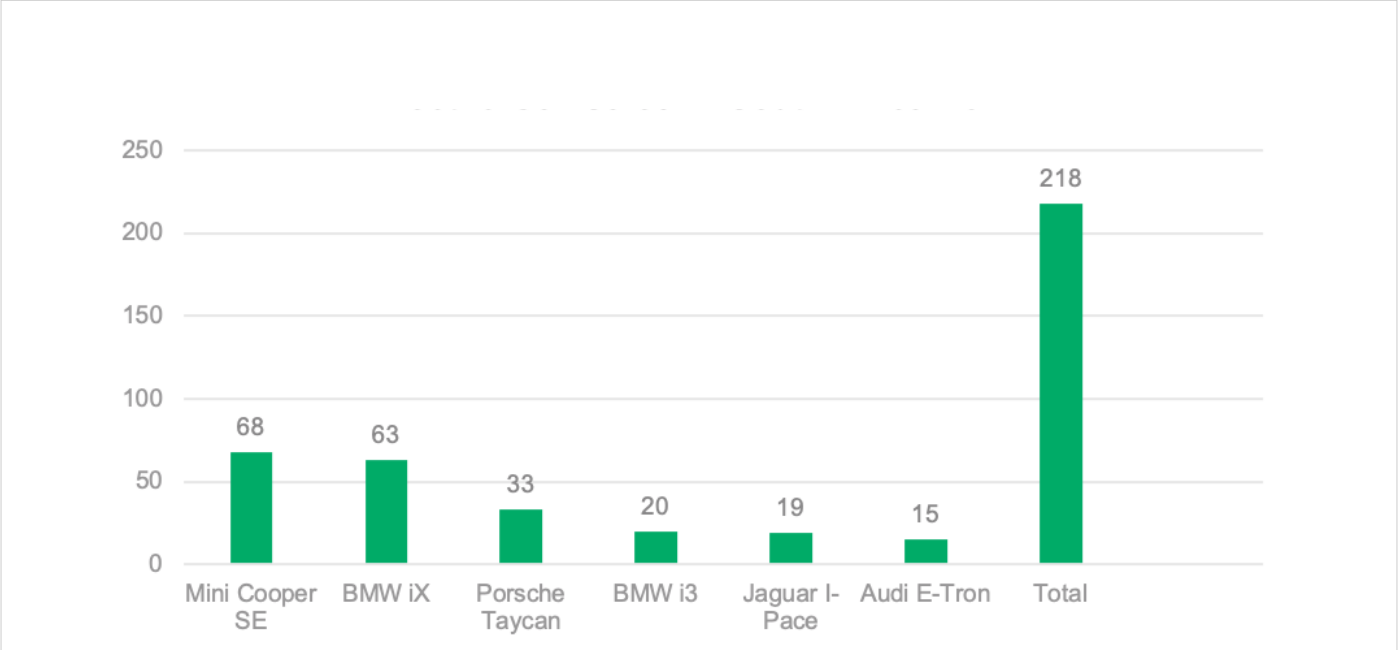


Figure 2: EV Sales by Brand in South Africa in 2021

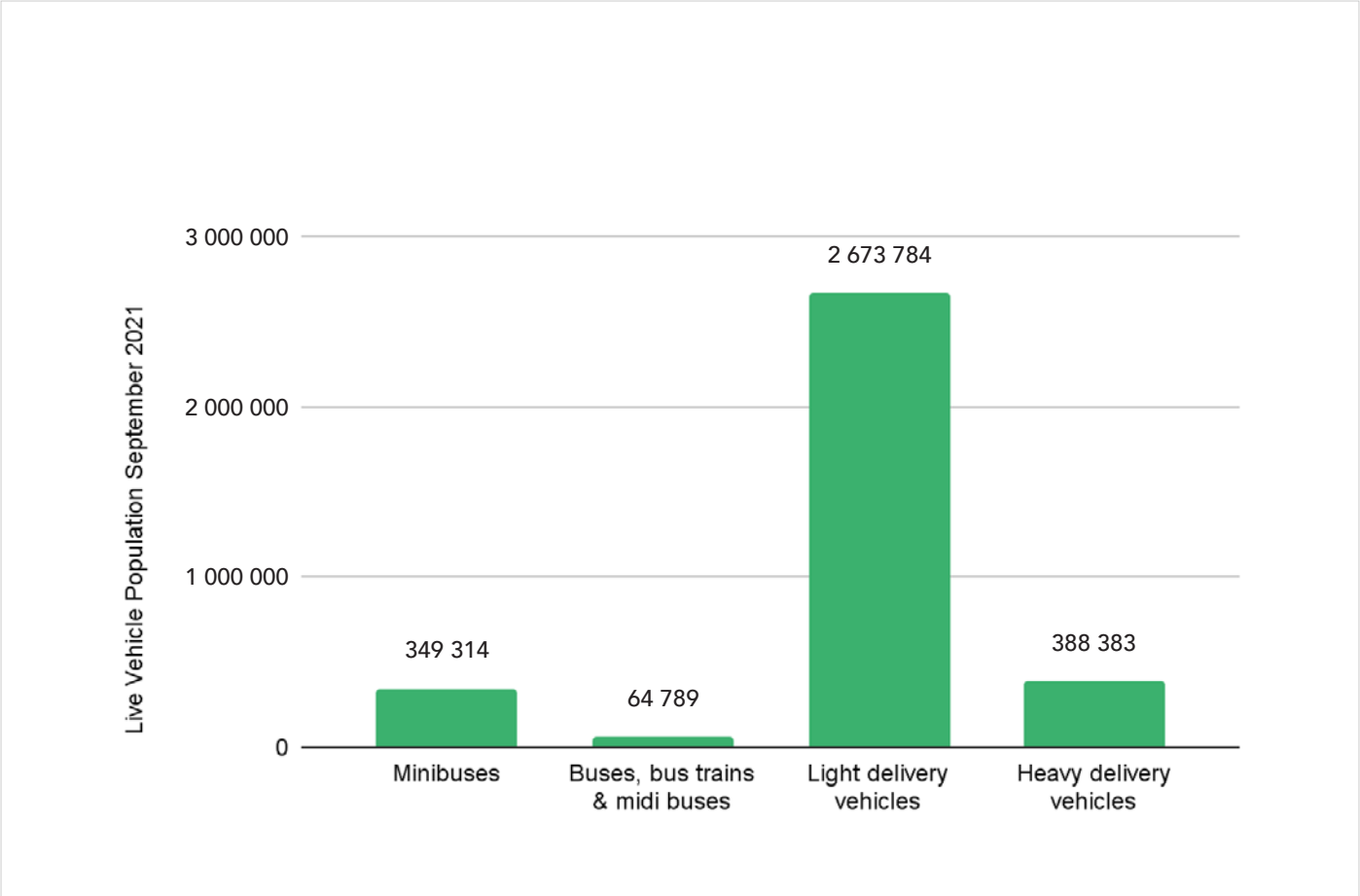


Figure 3: The potential market size of EVs in South Africa by market segment (eNatis 2021)

Light delivery vehicles (~2.7 million) represents the ***largest market segment*** *in South Africa outside of private passenger motor vehicles (~7.6 million).*

3 Overview of the global EV manufacturing ecosystem

The global transition to EVs has accelerated in the post-covid19 landscape led by Tesla, BYD and a number of emerging EV start-ups. Traditional automotive OEMs are also catching up with the transition to electric vehicles with significant investments being made into research and development to improve electric propulsion and lithium-ion battery technology. An overview of the global trends in this space is explored to develop a lead list of potential electric vehicle OEM's which should be approached by the ASEZ to set up local manufacturing operations in Cape Town.

3.1. EV assembly options for the ASEZ

3.1.1 NEW MARKET ENTRY OEMS

The global EV industry has been disrupted by the introduction of pure battery electric market players such as Tesla, which has increased market pressure for traditional OEMs to switch to manufacturing New Energy Vehicles (NEVs).

Global EV new market entry OEMs

- Tesla (USA)
- Rivian (USA)
- Lucid (USA)
- Canoo (USA)
- Arrival (UK)
- Polestar (Sweden)
- BYD (China)
- Nio (China)

Figure 4: Global EV new market entry OEMs

3.1.2 TRADITIONAL AUTOMOTIVE OEMS

A number of the traditional automotive OEM's identified in this section already have existing ICE vehicle assembly plants in South Africa primarily located in Gauteng, Eastern Cape and KwaZulu-Natal. Whilst there has been little movement with regards to these local industrial facilities producing electric vehicles, there is a significant opportunity for the Atlantis Special Economic Zone to attract EV manufacturing by creating an attractive ecosystem in which most of the major component suppliers are located.

Another approach would consist of the ASEZ becoming a major component supplier of a strategic electric vehicle component such as lithium-ion battery cells for which there is currently no competing supplier in South Africa. This would provide a much needed competitive advantage for the ASEZ to become a market shift leader and deeply integrate itself into the South African EV value chain.

Global EV traditional OEMs

- BMW
- Jaguar & Land Rover
- Volvo
- Audi
- Daimler
- Toyota
- Nissan
- Ford
- General Motors
- Honda
- Hyundai Kia
- VW

Figure 5: Global EV traditional OEMs

Figure 6 shows a map of the existing automotive assembly clusters located in Gauteng, the Eastern Cape and KwaZulu-Natal. Of the traditional OEMs already located in South Africa BMW, Nissan, Ford, Hyundai, Volvo, Toyota, Volkswagen and Mercedes are all rolling out EVs globally. The South African automotive manufacturers have yet to announce local production of battery EVs due to a lack of financial or policy incentives to encourage them to do so. There is also uncertainty regarding Eskom's grid stability which may be preventing further investment in EV's.

Gauteng

OEM

BMW South Africa (Pty) Ltd

Nissan South Africa (Pty) Ltd

Ford Motor Company of Southern African (Pty) Ltd

Commercial Vehicles & Bus Companies

Babcock, Elcher Trucks, Flat Group, Ford, Hyundai, Iveco, JMC, Man Truck & Bus, MarcoPolo, Peugot Citreon, Powerstar SA, Scania, Tata Trucks, VDL Bus & Coach and Volco Group Southern Africa.

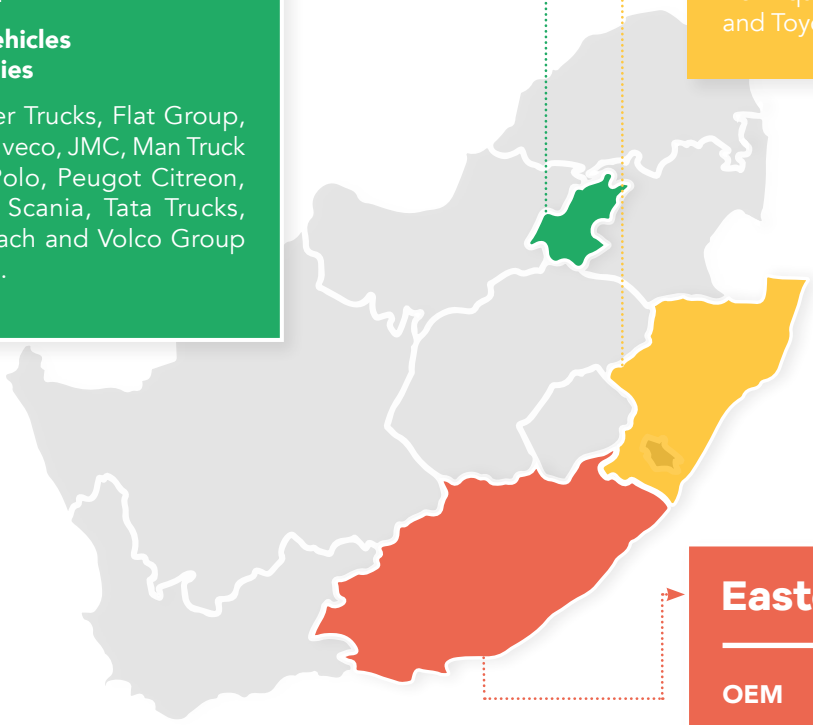
Kwazulu-Natal

OEM

Toyota South Africa Motors (Pty) Ltd

Commercial Vehicles & Bus Companies

Bell Equipment, MAN Truck & Bus and Toyota (Hino)



Eastern Cape

OEM

Volkswagen Group South Africa (Pty) Ltd

Mercedes-Benz SA Ltd

Isuzu South Africa

Commercial Vehicles & Bus Companies

FAW Trucks, Isuzu Truck, Mercedes-Benz SA (Freightliner and Fuso) and Volkswagen Group SA

Figure 6: A map of existing automotive assembly clusters and OEMs producing ICE vehicles in South Africa

Figure 7 shows that Tesla is still the leading EV OEM globally with a market share of almost 21% in 2021. It is understood that Tesla's manufacturing process is vertically integrated meaning that the company tends to in-source all components of the manufacturing process which leaves little room for South African suppliers to plug into Tesla's global supply chain.

01 — **Tesla - *21% Market Share***
935 172 vehicles sold

02 — **SAIC-GM-Wuling Automobile - *13% Market Share***
609 730 vehicles sold

03 — **Volkswagen Group - *10% Market Share***
451 131 vehicles sold

04 — **BYD - *7% Market Share***
323 143 vehicles sold

05 — **Hyundai Motor Group - *5% Market Share***
216 562 vehicles sold

Figure 7:The Top 5 EV companies by market share in 2021

Recommendation

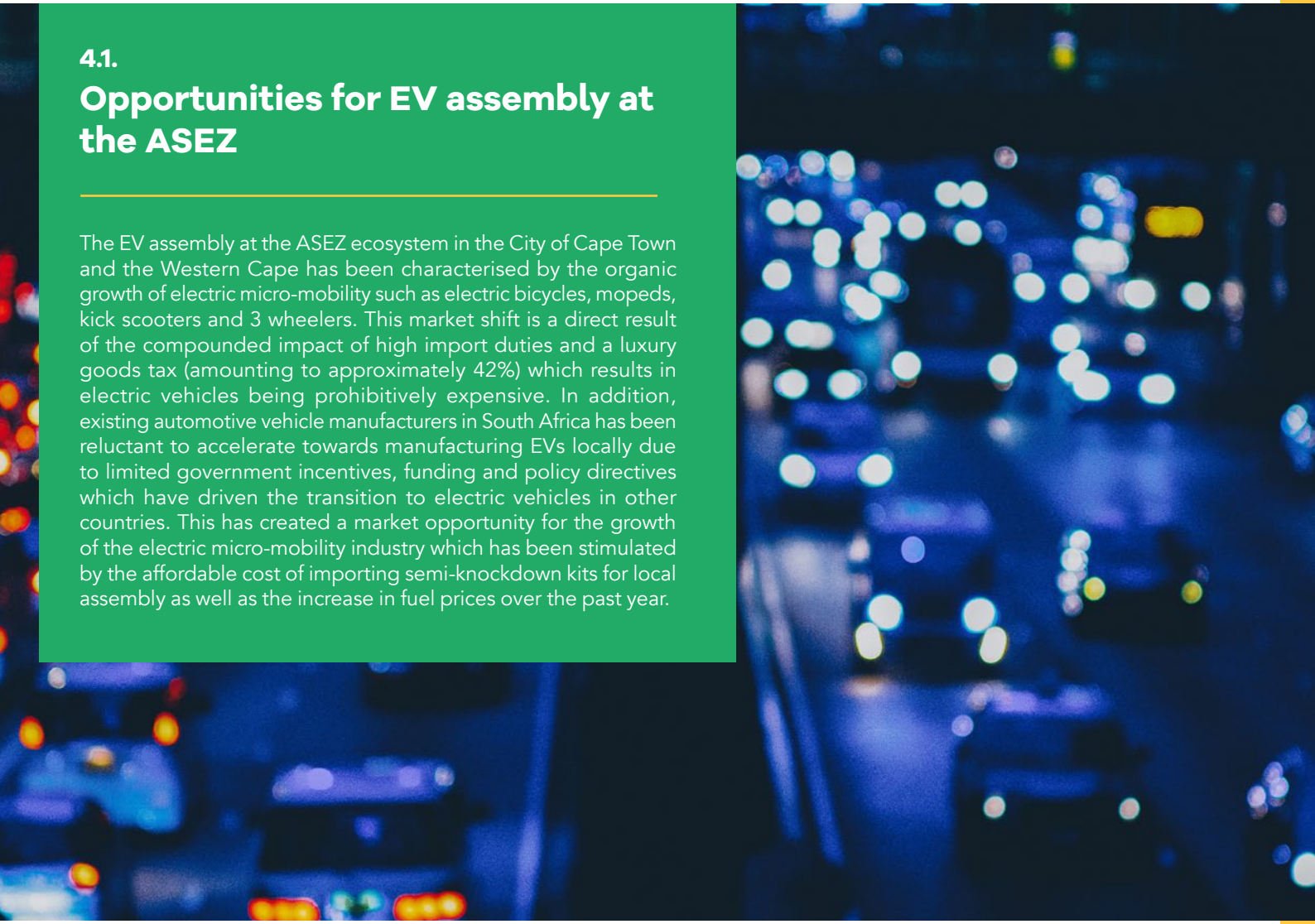
Learnings from other countries which have tried to attract Tesla to set up a Gigafactory in their Special Economic Zones include the following: Tesla will only manufacture their vehicles in a country where they can easily import their EVs at first, in order to test the local market for demand for their vehicles which remain in the higher price range. Tesla will also invest in a country that has a strategic natural resource which could potentially create a bottleneck in their supply chain process such as the case of Indonesia, which has the world's largest reserves of nickel at 21 million tonnes, and is an important metal used in lithium-ion battery manufacturing. In January 2020, Indonesia banned the export of raw nickel ore which forced EV companies to start investing in local nickel processing plants. South Africa has the world's largest supply of manganese, another strategic mineral used to manufacture batteries. A similar approach to Indonesia could be used to move South Africa up the EV manufacturing value chain.

Based on global sales and market share in 2021, it is recommended that the ASEZ approach Tesla, SAIC, VW, BYD and Hyundai to potentially invest in an EV assembly plant. BYD would be the most attractive option due to the potential for electric bus and minibus taxi manufacturing at ASEZ. Mini Cooper, Porsche, Jaguar and Audi would also be important targets for investment in EV manufacturing in South Africa based on EV sales in 2021 and the fact that these OEMs do not have existing manufacturing plants in the country. Additionally, becoming a strategic component supplier for the EV manufacturing industry by establishing an in demand component manufacturing facility, such as for lithium-ion battery cells, would allow the ASEZ to integrate itself deeply into the EV supply chains of other automotive manufacturing hubs in South Africa, if and when they begin to manufacture EVs. There is currently no capacity to produce lithium-ion battery cells in South Africa despite the country holding reserves of important metals used to produce them.

4 Overview of the Western Cape EV ecosystem

4.1. Opportunities for EV assembly at the ASEZ

The EV assembly at the ASEZ ecosystem in the City of Cape Town and the Western Cape has been characterised by the organic growth of electric micro-mobility such as electric bicycles, mopeds, kick scooters and 3 wheelers. This market shift is a direct result of the compounded impact of high import duties and a luxury goods tax (amounting to approximately 42%) which results in electric vehicles being prohibitively expensive. In addition, existing automotive vehicle manufacturers in South Africa has been reluctant to accelerate towards manufacturing EVs locally due to limited government incentives, funding and policy directives which have driven the transition to electric vehicles in other countries. This has created a market opportunity for the growth of the electric micro-mobility industry which has been stimulated by the affordable cost of importing semi-knockdown kits for local assembly as well as the increase in fuel prices over the past year.



There are existing emerging EV OEMs in Cape Town, which should be nurtured and encouraged to set up their manufacturing facilities at the ASEZ through the provision of:

- Tax Incentives
- Financial Assistance Loans and or Grants
- Business & Manufacturing Plan Development Support
- Supply Chain Development through co-location & clustering
- Transport & Logistics infrastructure linking the ASEZ to the Port of Cape Town

Figure 8: Major EV ecosystem OEMs in the Western Cape

4.1.1. ELECTRIC LIFE RIDES

Electric Life Rides is an electric kick-scooter as a service company based in Cape Town which is transforming the way that people commute by offering electric scooters as a service at various public stations in Cape Town. The electric scooter is a relatively new mode of electric micro-mobility with a growing presence in the South African market. This mobility mode was initially introduced as a recreational activity in the City of Cape Town with key uptake points being the Seapoint Promenade and V&A Waterfront. The gradual rollout of supply across the City of Cape Town could eventually lead to opportunities for electric scooters to be used for mainstream commuting purposes as a form of sustainable and low cost personal mobility.

Figure 9: Figure Showing Electric Life Rides Kick-Scooter

Recommendation

The electric kick-scooter is still a growing sector in the mobility sector with small uptake amongst recreational users. Figure 10 shows the major players in the global electric micro-mobility industry who would be potential export market consumers of electric kick-scooters manufactured at the ASEZ:

Shared Micromobility Hardware Strategies

	Suppliers	Operators
Commercial Off-the-shelf fleet hardware solutions. Option to add aftermarket IoT.	ACTON, Segway-Ninebot, superpedestrian, YIMI	SPIN, lyft, gris
Configurable Select components and/ or co-design vehicle with a manufacturer.	Hybrid: HONGJI, ZIMO®, OKAI; Juiced	TIER, circ, JUMP by Uber, voi., pony
Custom Design and engineer vehicle in-house. Source suppliers and contract manufacturers.	RADIO FLYER, FOXCONN®, flex	Lime, Razor, skip, BIRD

Low ↔ High: Degree of customization

Figure 10: Global electric micro-mobility ecosystem

Figure 11: An electric kick-scooter component diagram

4.1.2. GREEN RIDERS

Green Riders is an Electric Bicycle as a Service start-up which currently has can operational fleet size of 100 electric bicycles. The business model of Green Riders is to lease electric bicycles to last-mile delivery drivers in the online food and grocery services industry. Electric bicycle knock-down kits are imported and assembled at their facility in Riverside Park Industrial. Battery packs are also assembled on-site using imported lithium-ion cells using an in-house developed battery management system. The monthly lease for the electric bicycle includes maintenance, tracking and charging.

The electric bicycles used by Green Riders have a range of 100km on a single charge and make use of a battery swap system to reduce waiting times when recharging. The eBikes have a delivery cargo box that is built onto the back of eBike known as a ViziCube. This not only allows the riders to safely transport food and grocery parcels and also functions as an advertising mechanism which is an additional revenue stream for Green Riders which strengthens the financial sustainability of their enterprise. There is an opportunity for Green Riders to localise their component supply chain significantly using existing suppliers in Cape Town.

Figure 12: Green Riders Electric Cargo Bike

Recommendation

Green Riders should be encouraged to localise their component supply chain and set up a new larger manufacturing facility at the ASEZ. This can be achieved through the use of tax and other financial incentives which would make it attractive for a fast growing SMME to relocate to the special economic zone. It is important that other electric micro-mobility manufacturers are co-located with Green Riders at the ASEZ so that component suppliers can be shared, to create upstream scaling opportunities for suppliers of batteries, plastic, metals and rubber as explained in figure 13 below:

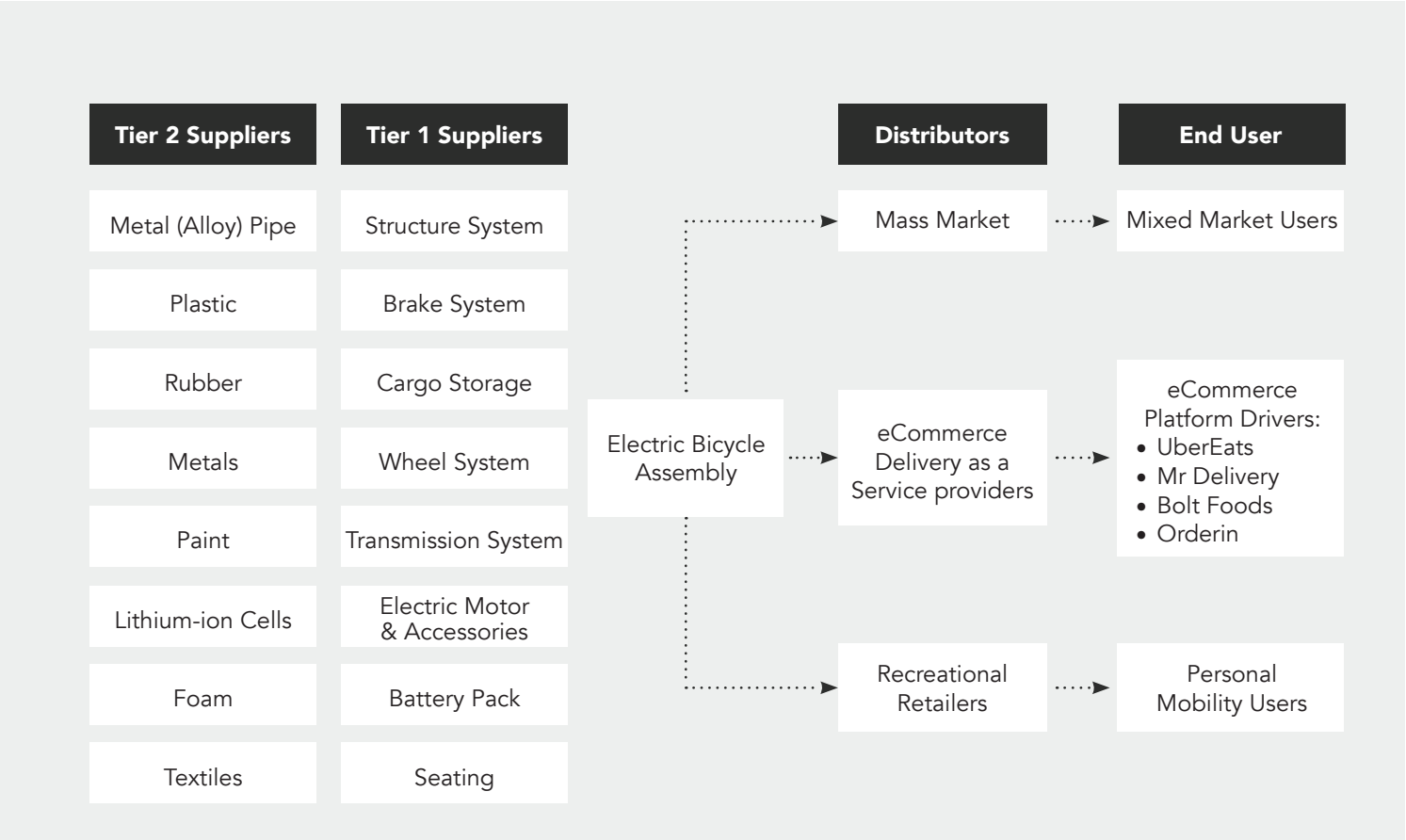


Figure 13: Electric bicycle & electric kick-scooter manufacturing value chain

4.1.3. GO-ELECTRIC

Go-Electric is an electric micro-mobility start-up which is planning to assemble electric mopeds in Cape Town from imported semi knock-down kits. The electric moped market in South Africa has untapped potential due to the fuel saving benefits of switching from an ICE motorcycle to an electric equivalent. In the last-mile food and grocery delivery space, the electric motorcycle has the advantage of being able to travel up steeper inclines and more robust terrain than a comparable electric bicycle. The expanded rollout of charging infrastructure across the City of Cape Town will expand the range capabilities of this mode of mobility for both personal transport and last-mile delivery services. In 2022, Go-Electric in partnership with AEVERSA and the Spar Group commissioned a pilot project to use electric mopeds for Spar's online grocery delivery service.

Figure 14: The Go-Electric moped pilot project with the Spar Group

Recommendation

Go-Electric should be encouraged to localise their component supply chain and set up a new manufacturing facility at the ASEZ. This can be achieved through the use of tax and other financial incentives which would make it attractive for a fast growing SMME to relocate to the special economic zone. It is important that other electric micro-mobility manufacturers are co-located with Go-Electric at the ASEZ so that component suppliers can be shared, to create upstream scaling opportunities for suppliers of batteries, plastic, metals and rubber as explained in figure 15.

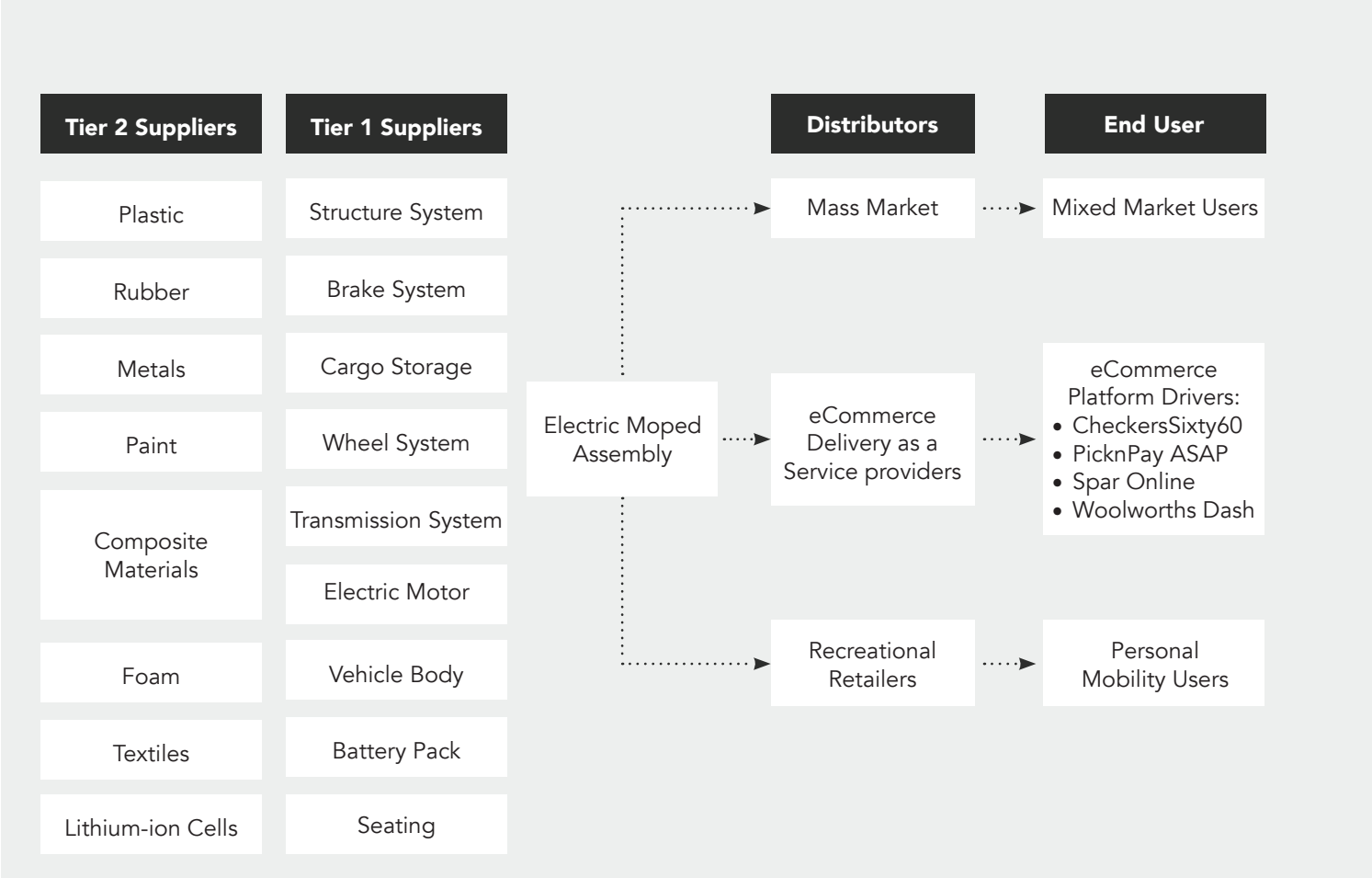


Figure 15: Electric bicycle & electric kick-scooter manufacturing value chain

Figure 16: The MellowVans being used by DHL for last-mile delivery

4.1.4. MELLOWVANS

MellowVans is a South African, electric 3-wheeler original equipment manufacturer based in Stellenbosch in the Western Cape. MellowVans has been an early pioneer in the electric mobility space having initially introduced their electric three-wheeler into the South African market for passenger transport, but has since switched towards supplying the growing last-mile delivery industry which is experiencing an economic upswing due to the post Covid19 e-Commerce boom.

Some of their largest clients in Cape Town include DHL, Takealot and Skynet with room for further growth as the last-mile delivery sector continues to electrify as a means of dealing with the high increase in fuel prices. With manufacturing facilities in Stellenbosch and Strand they currently have a production capacity of four electric three-wheelers per day with an almost 70% local component usage. This is a significant achievement from a South African origin electric vehicle start-up and MellowVans should be supported by the City of Cape Town to scale its operations and gain a larger footprint in the mobility market.

MellowVans has also recently started exporting their vehicles to Europe which shows the strength of the electric three-wheeler export market. This should be nurtured and expanded on by inviting MellowVans to become a part of the Made in Cape Town Initiative initiative with access to marketing brand power and matchmaking potential of the digital export platform that has been developed by Wesgro.

Figure 16 shows a MellowVans electric 3-wheeler that is being used for last-mile delivery by DHL in Cape Town. This type of vehicle is well suited to short delivery trips within the Cape Town CBD area and assists DHL to save operational costs due to the fuel savings. MellowVans currently operates on a monthly leasing model which also assists with the reduction of upfront capex cost as a market entry barrier. Unlike other electric vehicles, the MellowVans does not need special charging adaptors and can plug into any normal electric plug point which negates the requirement of specialised charging stations.

Recommendation

As MellowVans continues to grow and expand their manufacturing of electric three wheelers in Cape Town, they should be incentivised to relocate their operations to the ASEZ to benefit from the electric vehicle component supply chain which can be developed by co-locating all EV manufacturers into a single precinct. MellowVans extended 70% local component supplier network should also be encouraged to relocate to ASEZ to supply components to the greater electric micro-mobility industry such as Green Riders, Go-Electric and Electric Life Rides. The manufacturing value chain of an electric 3-wheeler is shown in figure 17.

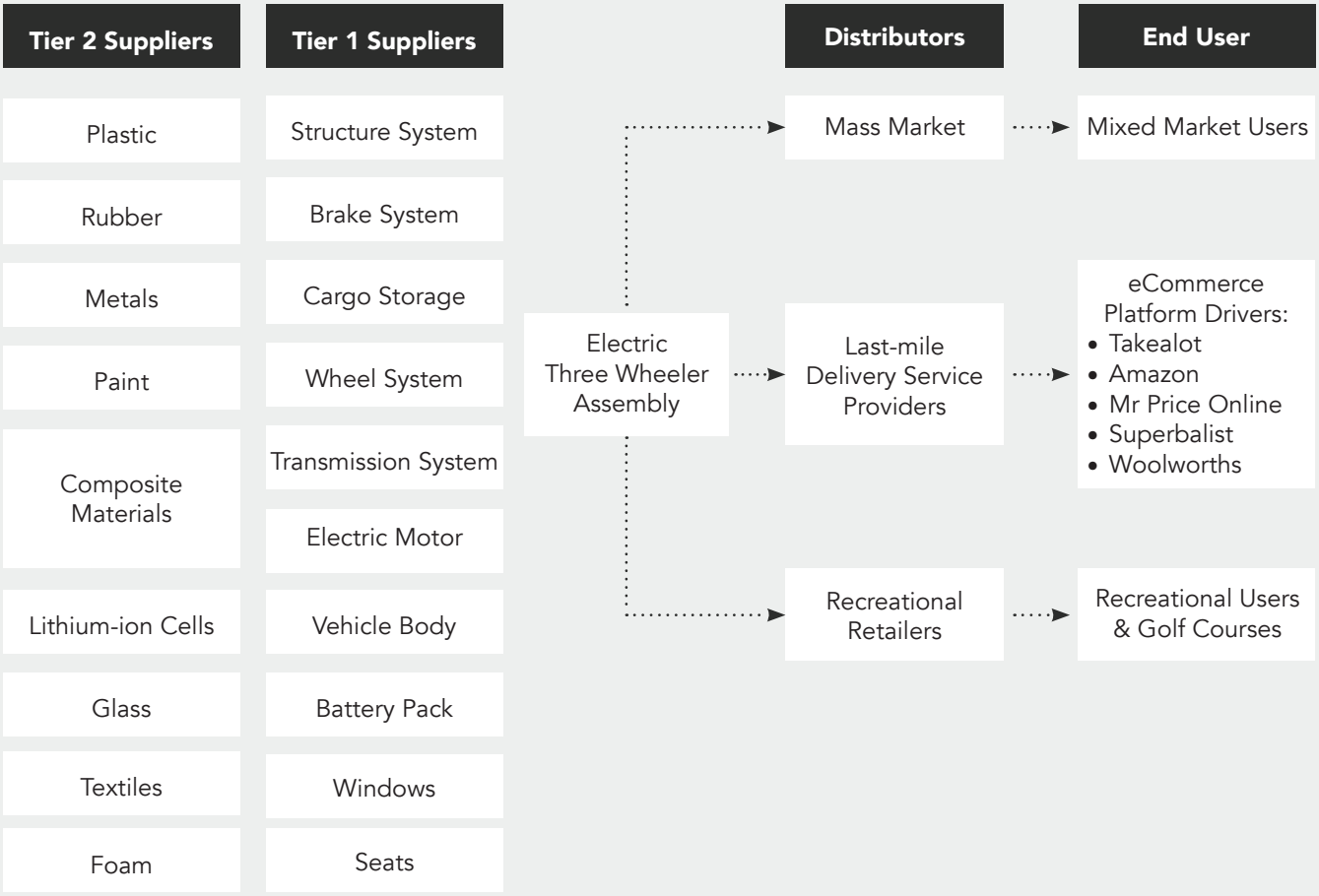


Figure 17: The electric 3-wheeler manufacturing value chain

4.1.5. FLX EV

Flx EV was the winner of the GreenCape GreenPitch Challenge 2022 in the pre-venture category. This innovative start-up has secured exclusive distribution rights in South Africa for a right-hand drive battery electric minibus taxi. Flx EV aims to import the first three vehicles by November 2022 for in-field testing with local minibus taxi drivers and associations to determine market fit and applicability to local operating conditions. They have also secured UYilo funding in partnership with Stellenbosch Municipality to upgrade the Bergzicht minibus taxi rank with rooftop solar PV and battery storage with fast DC chargers to enable opportunity charging during off-peak periods during the day. The electrification of the South African minibus taxi industry is potentially a transformative opportunity to formalise and electrify this traditionally informal industry as part of the Just Energy Transition.

A Flx EV right-hand drive electric minibus taxi has the following specifications:

- Range: >200 km
- Charging: AC and DC compatible
  Capacity: 14-16 passengers
- Incline threshold: >15°
- Curb weight: <3500kg
- Length: <6 metres
- Brakes: ABS brakes
- Sliding door

Figure 18: Flx EV's electric minibus taxi

Recommendation

Flx EV is interested in importing Disassembled-Knocked-Down (DKD) kits, Semi-Knocked-Down (SKD) kits, and then later on Completely-Knocked-Down (CKD) kits and setting up an assembly plant at the ASEZ. They require a partnership with an experienced vehicle assembler in South Africa to guide the mass assembly of electric minibus taxis for the South African market. There are currently only three available minibus taxi assemblers in South Africa: Toyota (eThekwini), Nissan (Pretoria) and Busmark (Blackheath Industrial, Cape Town). Only Busmark: Designs, develops, manufactures, maintains and services buses on behalf of local and international OEM's, using local funding, labour and material. In addition, only Busmark has assembled an electric vehicle before for BYD and Golden Arrow. Therefore, it is recommended that the ASEZ approach Flx EV in partnership with Busmark to assemble electric minibus taxis at the ASEZ.

4.1.6. BYD

Build Your Dreams (BYD Auto) is a Chinese electric vehicle OEM with a presence in the South African market. They have supplied two battery electric Bus Rapid Transit type buses to Golden Arrow Bus Services in 2021 as part of an electric bus trial which also received funding from UYilo. The buses were assembled in South Africa using local bus manufacturing partners Busmark. The feasibility study involving the two electric buses is still continuing in 2022 and it is understood that upon completion of this process, BYD will manufacture an electric 65 seater commuter bus for Golden Arrow Bus Services. This will be undertaken using a locally based manufacturing partner and could be an important future tenant of the ASEZ.

BYD is currently the only active electric bus OEM in South Africa. Their strategy when winning bus contracts is to work with a local bus assembly company. Bus bodies are designated by the dtic with an 80% local component requirement for the bus bodies.

The following bus assemblers are available in South Africa:

- MAN Bus & Coach (Pty) Ltd (Olifantsfontein)
- Busmark (Randfontein & Cape Town)
- Marcopolo (Germiston)
- Scania (Johannesburg)
- MCV (Cape Town)

Only Busmark: Designs, develops, manufactures, maintains and services buses on behalf of local and international OEM's, using local funding, labour and material; has assembled an electric bus in South Africa before; has assembled an electric bus for BYD in South Africa before.

Figure 19: Golden Arrow electric bus assembled by Busmark in Cape Town for BYD

Recommendation

Encourage Busmark to relocate their Cape Town factory to Atlantis Special Economic Zone so that any electric bus assembly contracts that are won either through Golden Arrow Bus Services, My Citi Bus Rapid Transit system or the Go George Bus Rapid Transit system are secured for the ASEZ.

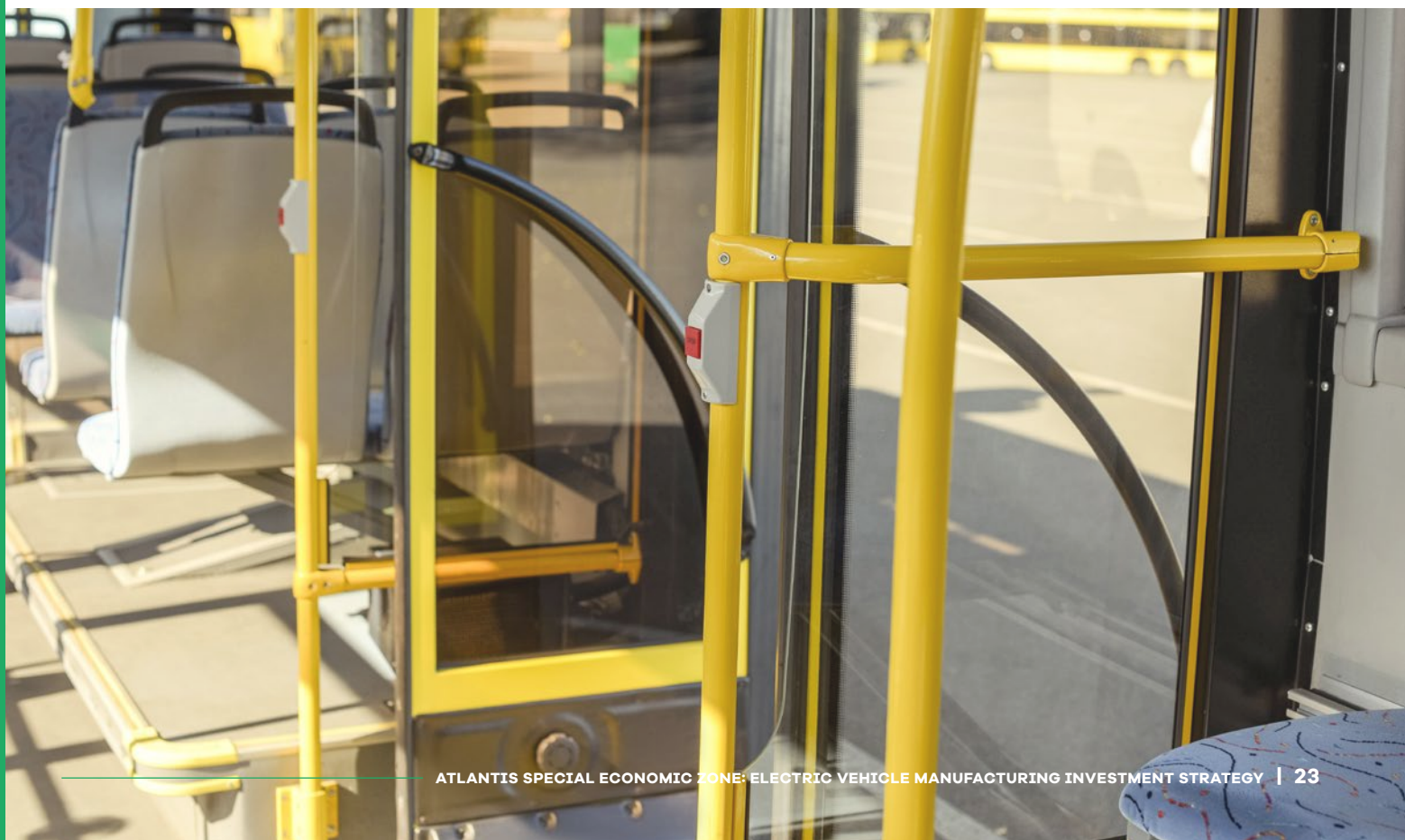


Figure 20 explores the manufacturing value chain of an electric bus / minibus taxi and the upstream industries which can be developed if an electric bus and or minibus taxi factory is established at the ASEZ.

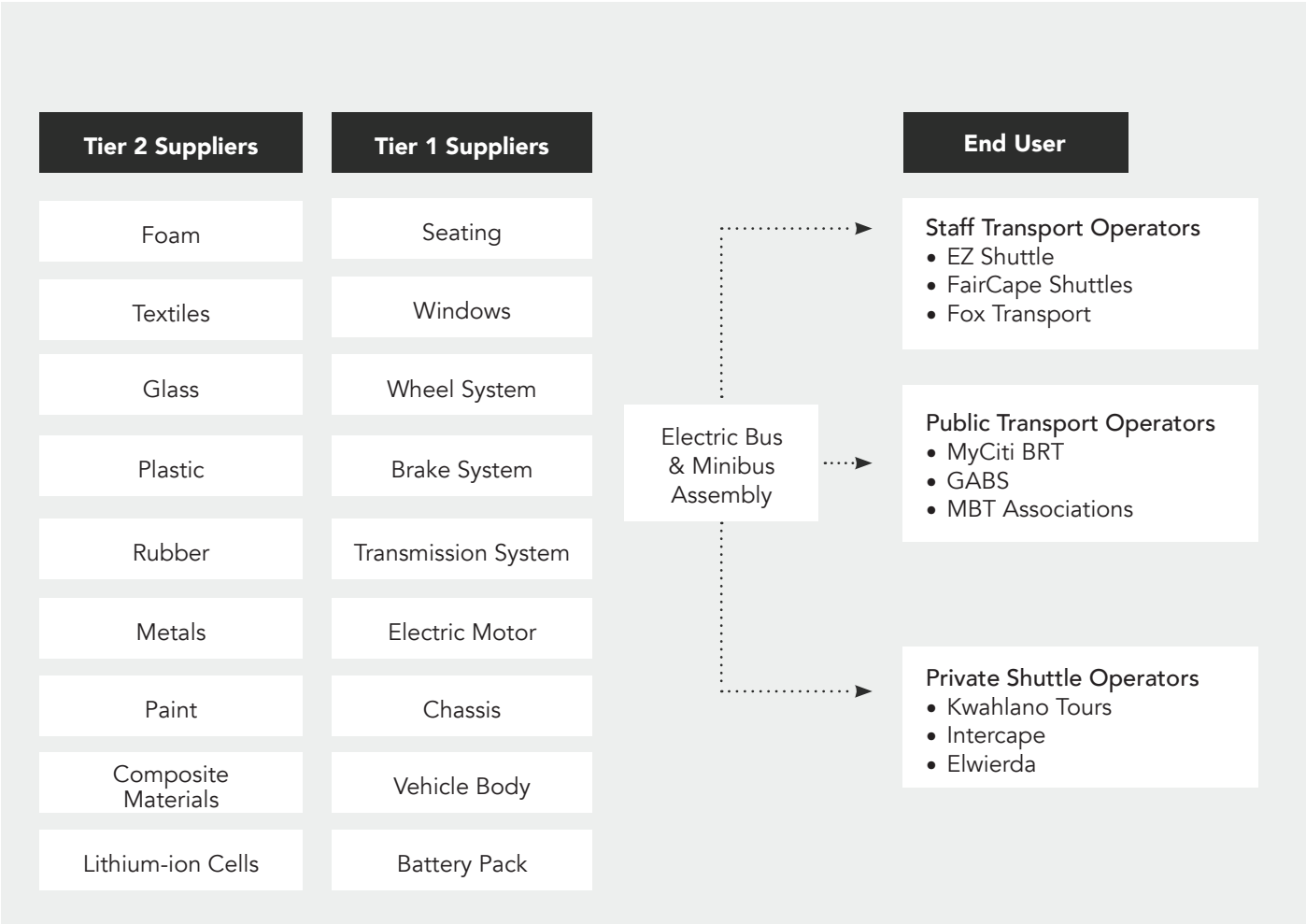


Figure 20: Electric bus and or minibus taxi manufacturing value chain & upstream industries

4.1.7. SCANIA

Scania, the Swedish truck and bus company is preparing to launch South Africa's first battery electric truck in the South African market in 2022. As an established global manufacturer of trucks and buses, the market entry of Scania into the local electric vehicle market is an important lever to decarbonise the South African trucking industry. In this transition from a diesel ICE engine to electric, only the "horse" of the truck is replaced with an electric equivalent which minimises disruption of the existing supply chain. Capacity already exists to manufacture truck trailers in South Africa.

Figure 21: Scania electric trucks

Electric Truck Specification:

- WHEEL CONFIGURATION - 4x2, 6x2, 6x2*4
- AXLE DISTANCE - 3 950 – 5 750 mm
- CAB OPTIONS - P, L
- PROPULSION - Permanent magnet electric machine with oil spray cooling.
  - 295 kW 2 200 Nm (peak)
  - 230 kW 1 300 Nm (continuous)
  - 60 kW electric Power Take-off

Batteries and Charging:

- 9 Lithium Ion batteries, available for all axle distances over 4 350 mm: - 300 kWh (Installed)
- 5 Lithium Ion batteries, available for all axle distances over 3 950 mm: -165 kWh (Installed)
- CHARGING - CCS type 2 plug-in connection up to 130 kW/ 200A DC charging
- GTW - Max 29 t

Available electric truck assemblers in South Africa:

- Scania (Horse & trailer)
- MAN (trailer)
- SA Truck Bodies (trailer)
- RamCom (trailer)

Recommendation

Encourage Scania to set up their electric truck manufacturing plant at ASEZ as well as a large truck body manufacturer such as SA Truck Bodies.

Tier 2 Suppliers	Tier 1 Suppliers		End User
Foam	Seating		
Textiles	Windows		
Glass	Wheel System	Electric Truck (Horse & Trailer Assembly)	**Frieght & Logistics Providers** • Checkers • Grain Carriers • Value Logistics • Barloworld Logistics • Imperial Logistics • Laser Logistics
Plastic	Brake System		
Rubber	Transmission System		
Metals	Electric Motor		
Paint	Chassis		
Composite Materials	Vehicle Body		
Lithium-ion Cells	Battery Pack		

Figure 22: Electric truck manufacturing value chain and upstream industries

5 Component manufacturing opportunities in the EV value chain

The key towards unlocking jobs and investment in the EV manufacturing industry at the ASEZ is to move beyond just the assembly of electric vehicles and towards the local manufacturing of key components. The following industries have been identified as strong investment opportunities for EV industrialisation at the ASEZ:

- EV "skateboard" platform
- Lithium-ion cells
- Battery pack assembly
- Automotive glass
- Automotive plastic
- Composite materials
- Tyres
- Semi-conductors

5.1. EV skateboard platform manufacturing

The EV "skateboard" platform has revolutionised the way that electric vehicles are manufactured as all critical powertrain and drivetrain components, including the batteries, axles, suspension and power electronics, can be located in a flat rectangular platform. A high-strength steel or alloy frame is usually used which protects the battery pack and provides crash protection. This "skateboard" platform forms the undercarriage of the vehicle and a variety of body styles can be developed to fit the same platform, which saves automotive manufacturers money. The "skateboard" platform can also be manufactured and sold to 3rd party automotive manufacturers who then customise the vehicle body according to their brand and style.

Recommendation

The following 3rd party electric vehicle skateboard platform manufacturers should be approached to set up manufacturing facilities at the Atlantis SEZ:

- Karma Automotive - 3rd Party Supplier
- REE Auto - 3rd Party Supplier
- Canoo - 3rd Party Supplier
- Rivian - 3rd Party Supplier

Any custom vehicle body can be developed on top of this "Skateboard" platform to service the minibus taxi, bus, truck, light delivery vehicle and private motor car market segments.

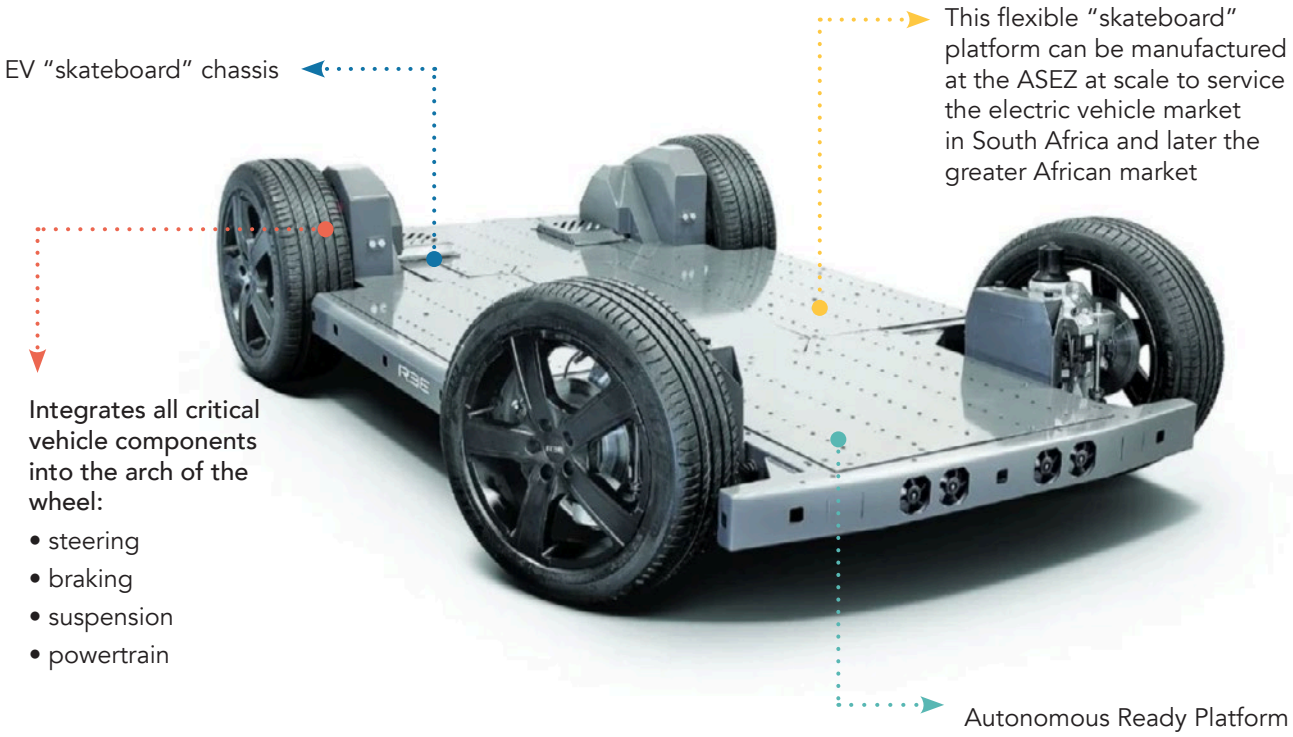


Figure 23: The REE Auto Electric Vehicle Skateboard Platform

5.2.
Lithium-ion cell manufacturing

South Africa has existing mining industries which are able to extract and process manganese, nickel, titanium, aluminium, copper and iron metals to supply a potential lithium-ion cell manufacturing industry at the ASEZ. There exists a current bottleneck with regards to the processing of these materials into cathode, anode, electrolyte, current collectors and cell casings in South Africa which is a market opportunity for investors looking to enter this market.

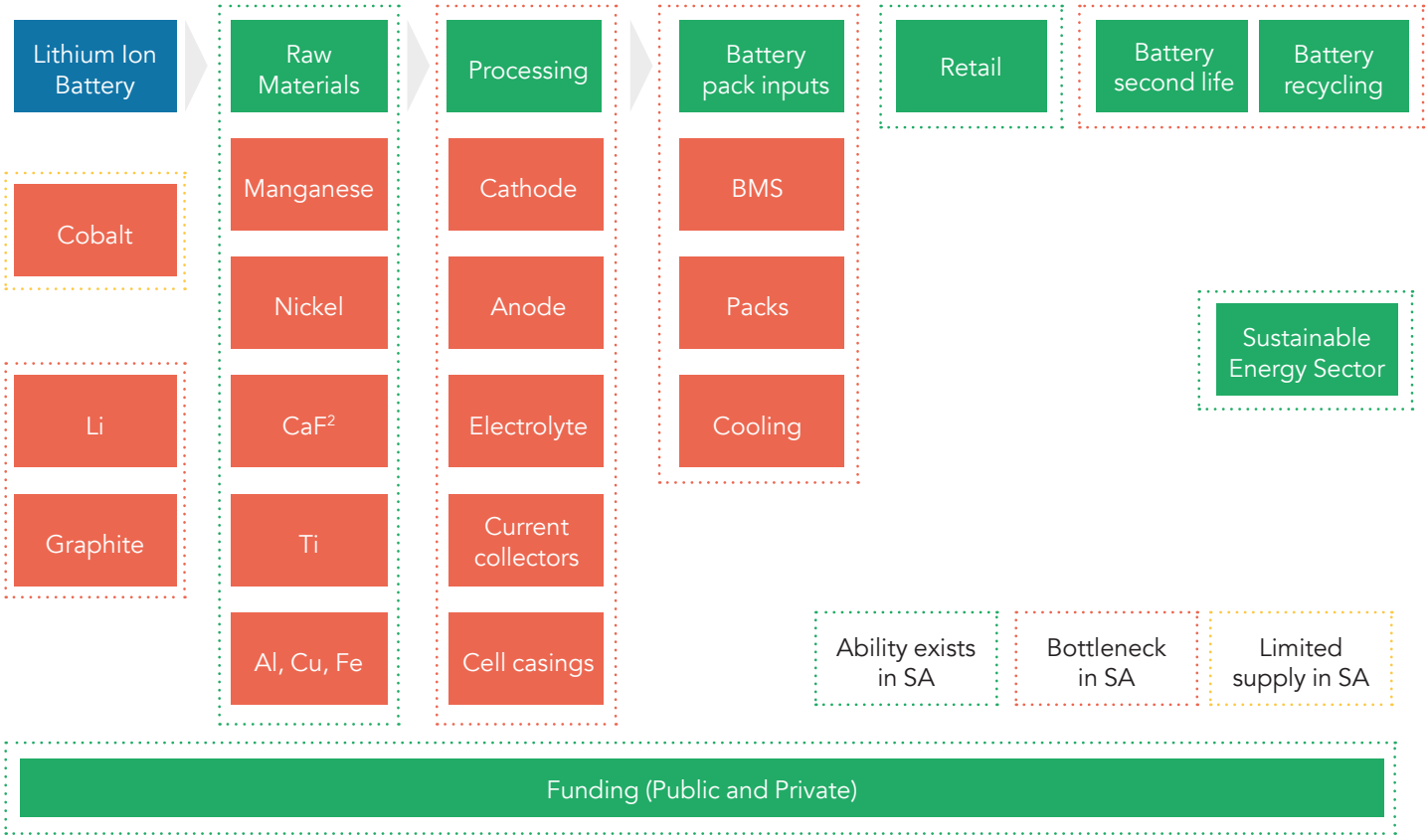


Figure 24: Lithium-ion battery cell value chain

The Manganese Metal Company (MMC) based in Mbombela, Mpumalanga is the largest processor of manganese outside of China and supplies 18% of the world's global supply. Around 70% of this is exported to Japan for use in the manufacture of lithium-ion batteries for the EV industry. South Africa should leverage its unique position in the global supply chain to localise lithium-ion battery manufacturing at the ASEZ

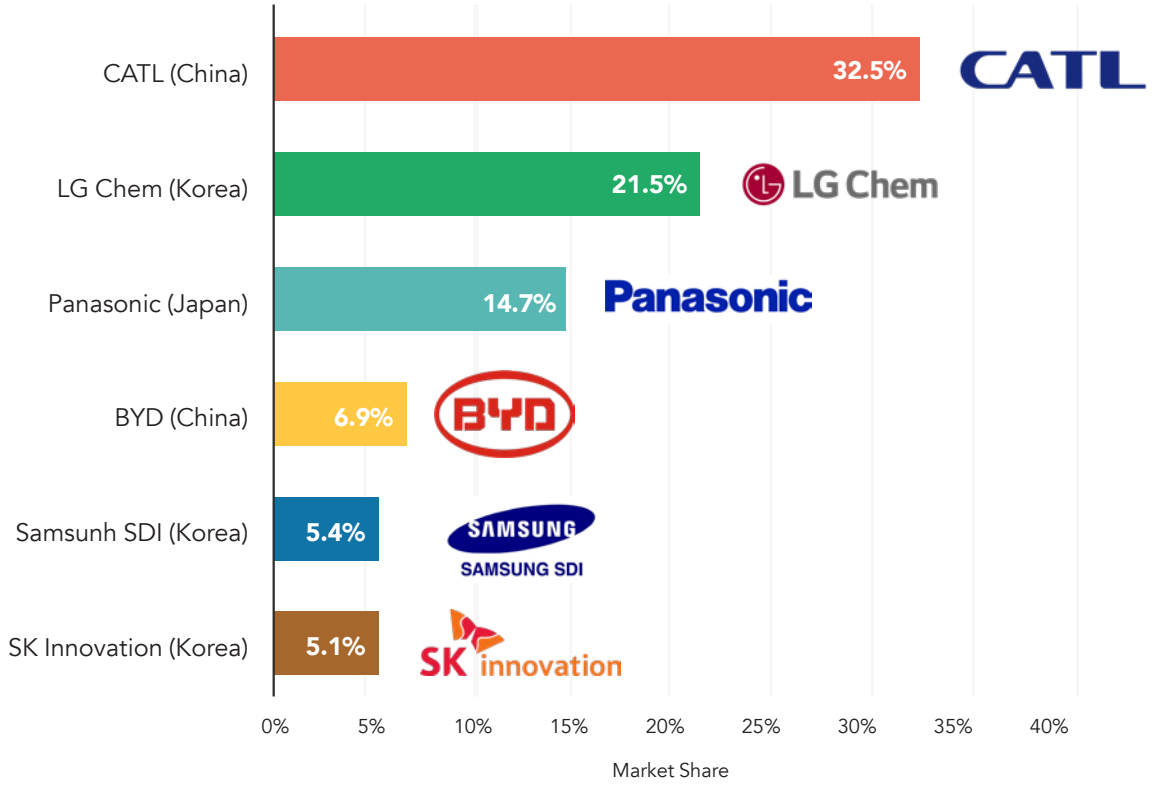


Figure 25: The top 5 global manufacturers of lithium-ion battery cells

Recommendation

Recommendation: As a long term strategy, the global top 5 lithium-ion battery cell manufacturers; CATL, LG Chem, Panasonic, BYD, Samsung and SK Innovation should be invited to set up manufacturing at the ASEZ. In the South African market only Metair and i-G3N have announced investments in the local manufacture of lithium-ion cells to supply the South African market. These two companies represent the best short to medium term opportunity to attract investment in lithium-ion cell manufacturing at the ASEZ.

5.3.
Battery pack assembly

Battery pack inputs such as Battery Management Systems (BMS), pack assembly and thermal cooling mechanisms are additional growth areas in the battery value chain. There are currently four prominent battery pack assembly companies in South Africa: Blue Nova, SolarMD, Polarium and Balancell. They currently supply the growing stationary energy storage market in South Africa with the exception of Balancell which has supplied MellowVans with EV battery packs.

Recommendation

Existing battery pack assemblers in South Africa: Blue Nova, SolarMD, Polarium and Balancell should be encouraged to relocate their operations to the ASEZ.

5.4.
Semi-conductor manufacturing

Semi-conductors are an integral component of high-tech EV manufacturing with only a few countries having the capacity to produce this important component. The figure below shows the global top 10 manufacturers of semi-conductors. The Taiwan Semi-Conductor Manufacturing Company is the world's largest producer of semi-conductors at 28% of the global supply. South Africa and the African continent at large currently does not have any semi-conductor manufacturing capability. However, the growth and sustainability of an EV manufacturing industry at the ASEZ would be strengthened by the local production of semi-conductors which would protect the local industry from geo-political supply-chain shocks.

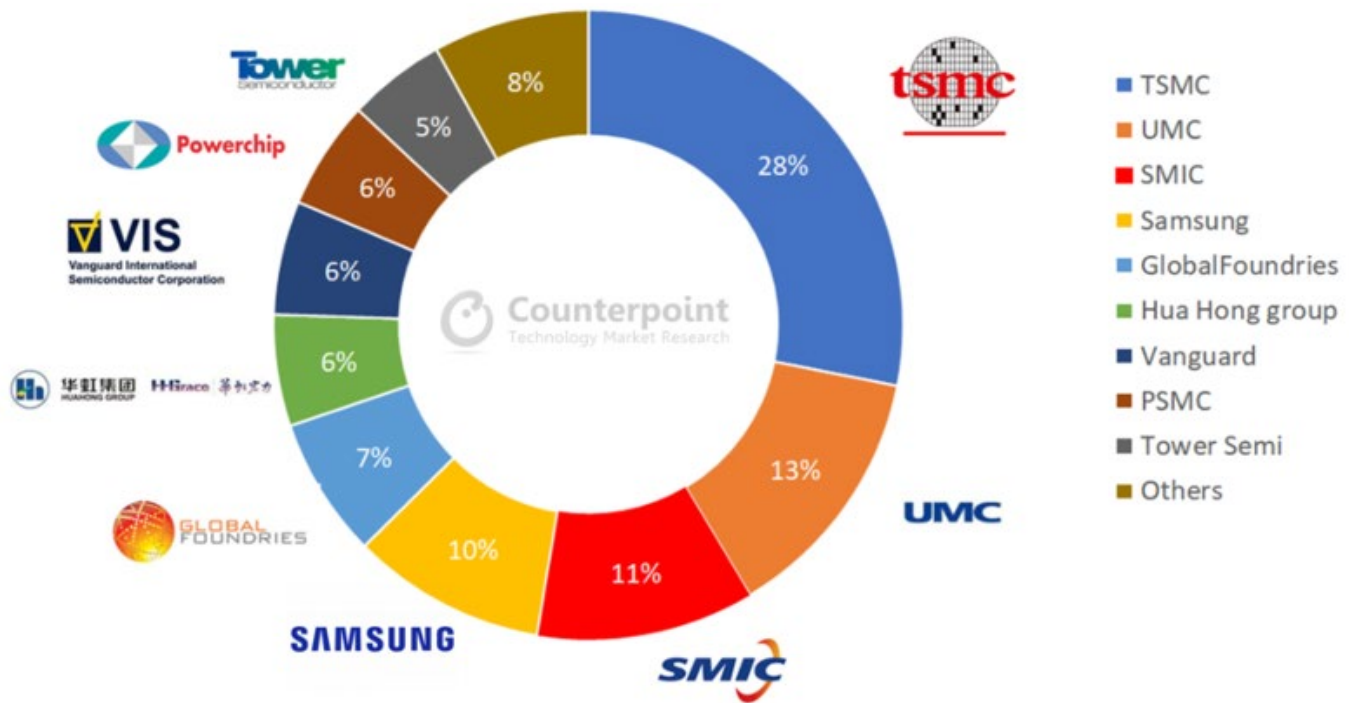


Figure 26: The top 10 global suppliers of semi-conductors

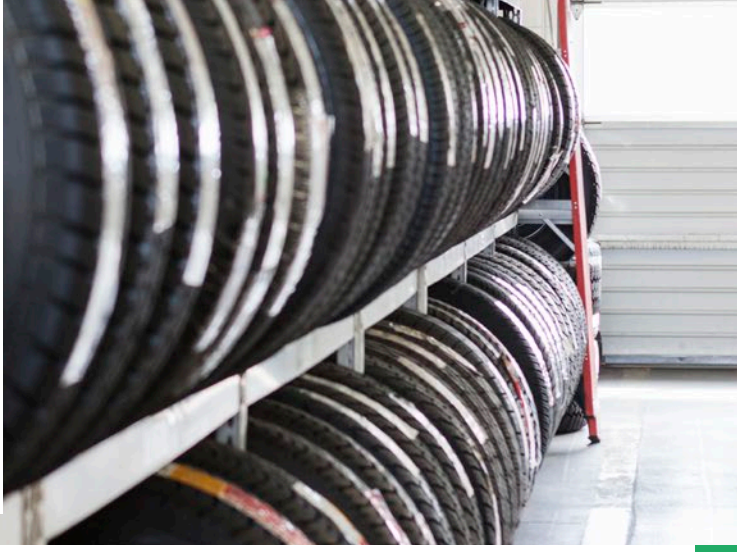
Recommendation

The top 10 global semi-conductor suppliers should be invited to set up manufacturing facilities at the ASEZ to supply the future electric vehicle manufacturing ecosystem that will be developed in Cape Town. A local semi-conductor manufacturing industry would make the Atlantis EV manufacturing cluster globally competitive and shield tenants from global supply chain shocks.

5.5.

Glass, plastic, composite material & tyre manufacturing

The glass, plastic, composite material and tyre manufacturing sectors have been identified as complementary EV component industries which should be encouraged to set up manufacturing facilities at the ASEZ. This would allow for finished EVs to be produced in Cape Town for local consumption in South Africa as well as for export.



5.5.1. AUTOMOTIVE GLASS

The leading automotive glass distributor in South Africa is Shatterprufe® with three modern, automated manufacturing plants. Shatterprufe® has a staff complement of 1500 personnel and they manufacture over 1.2 million windscreens and 2.5 million toughened glass parts annually. They are one of the few national auto glass manufacturers in the world that has the technology, equipment and skills to supply all the top global automotive brands. Over 6 million vehicles in South Africa are fitted with a Shatterprufe® supplied product. They manufacture over 5 million pieces of glass annually; 50% is distributed nationwide and the other 50% is exported to the USA and Europe. Their export product range consists of over 1500 windscreens and 3000 toughened rear glass and side glass parts.

Recommendation

The existence of South African competence in automotive glass manufacturing should be leveraged and Shatterprufe® should be invited to set up a manufacturing facility at the ASEZ to supply the future EV ecosystem that is to be developed.

5.5.2. AUTOMOTIVE PLASTIC & COMPOSITE MATERIALS

South Africa already has a well-established automotive plastic and composite material manufacturing supply chain which services the existing ICE automotive manufacturing hubs in Gauteng, the Eastern Cape and KwaZulu-Natal.

- GeMotoSA
- Ebor Automotive Systems
- Finke Plastics
- Injemo Engineering and Plastic Products

Recommendation

Existing automotive plastic and composite material suppliers can be identified through National Association of Automotive Component and Allied Manufacturers (NAACAM). A few have been identified although the actual supplier network is quite large with many potential stakeholders who should be engaged with to potentially located their manufacturing facilities at the ASEZ.

5.5.3. TYRES

EVs have considerably better acceleration, which means they require tyres that have higher stability and handling capabilities. Secondly, the EV battery is heavy, which creates the requirement for tyres that can support the weight of the vehicle at high speeds. Many of the most popular global tyre brands are now manufacturing specialized EV tyres to service this growing market. The top 5 tyre brands in the emerging EV industry globally are:

- Continental
- Firestone
- Pirelli
- Michelin
- Goodyear

Recommendation

It is recommended that the top 5 EV tyre suppliers globally (Continental, Firestone, Pirelli, Michelin and Goodyear) be invited to set up tyre manufacturing at the ASEZ to supply the future electric vehicle manufacturing ecosystem at the precinct.

6 Case Study: Gigafactory vs. Micro-factory

6.1. Gigafactory: Case study of Tesla Nevada

Gigafactories have become synonymous with regards to EV and battery manufacturing and has in part contributed towards a global renaissance of this industry. The term was first coined by Tesla and comes from the word 'giga,' the unit of measurement representing "billions." There is a growing international trend regarding what a gigafactory should consist of in terms of infrastructure, energy supply and transportation linkages which should be incorporated into the design masterplan of the ASEZ.

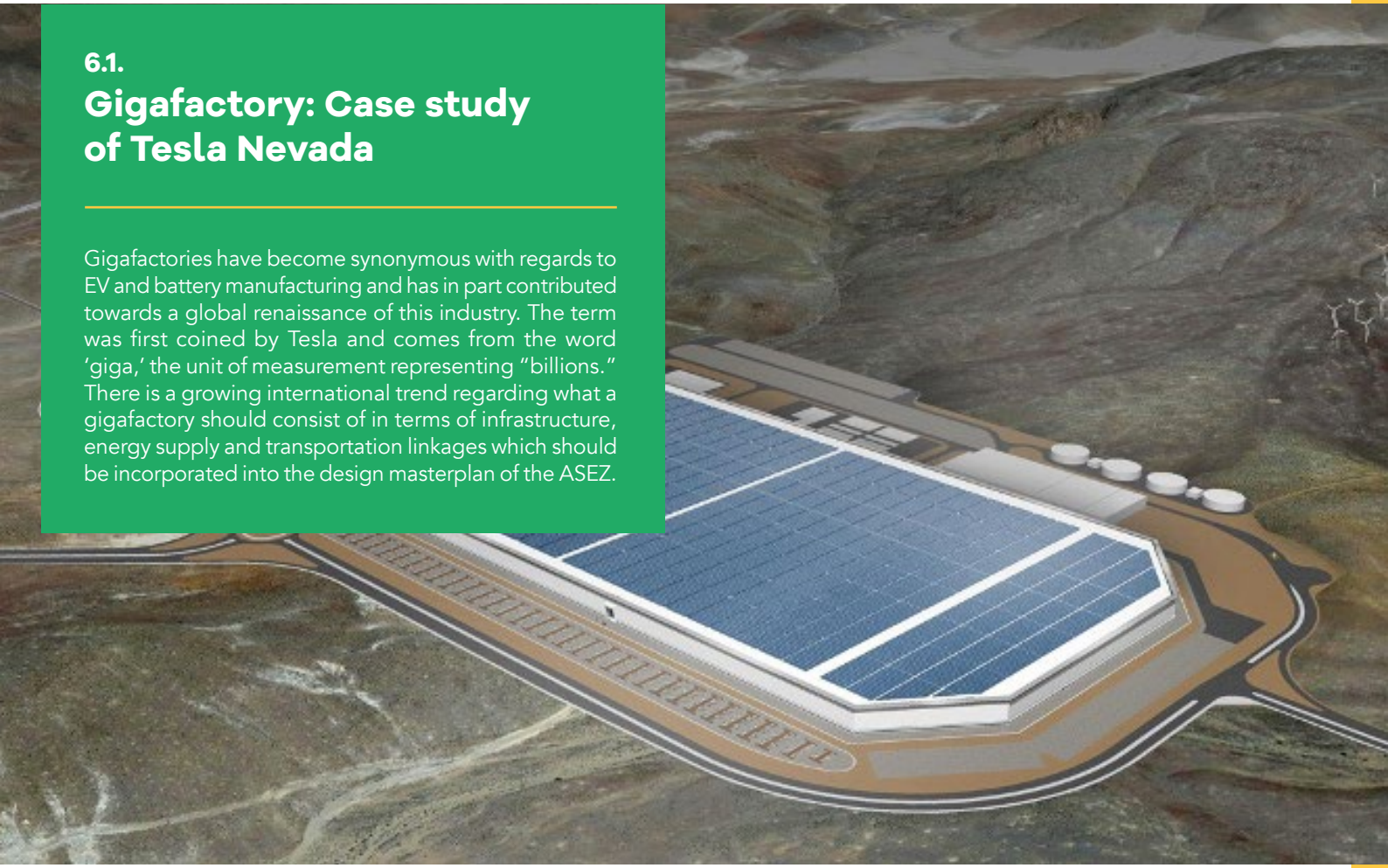


Figure 27: Tesla Gigafactory Nevada, USA

Many EV manufacturers are becoming more concerned regarding their Environmental, Social and Governance (ESG) rating with a push for EVs and their components to be manufactured using clean renewable energy. Powering the ASEZ entirely from solar and wind with Battery Energy Storage Systems (BESS) would increase the competitive value of EVs and other green technologies that are manufactured there. As part of the ASEZ Masterplan, all new factories in the precinct should have compulsory rooftop solar and battery storage to at least partly contribute towards the energy requirements of the EV manufacturing industry it wishes to attract. An example of this kind of infrastructure investment would be the Tesla Gigafactory in Nevada, USA shown in figure 27.

The rooftop solar array at Tesla Gigafactory Nevada is projected to have a capacity of 70MW of solar energy production when complete.

The Nevada Gigafactory is being built in phases so that Tesla can begin manufacturing immediately inside the finished sections and continue to expand thereafter. The current structure has a footprint of more than 1.9 million square feet, which houses approximately 5.3 million square feet of operational space across several floors.

Designed to be a net zero energy factory upon completion, the facility will be primarily powered by solar energy. With the Nevada Gigafactory ramping up production, Tesla's cost of producing battery cells will significantly decline through economies of scale, innovative manufacturing, reduction of waste, and the simple optimization of locating most manufacturing processes under one roof. The ASEZ funds the development of all factory top structures within the precinct, which is then leased to prospective tenants. It is important to choose a factory design which can maximise solar energy production for the ASEZ using global best practice when designing an EV manufacturing facility.

6.2.

Micro-factory: Case study of Arrival UK

Arrival is a British EV start-up which has revolutionised the way that EV's are manufactured through the use of micro-factories. Micro-factories are smaller than traditional automotive manufacturing facilities with a focus on robotics, automation and modular process design to streamline the efficiency of the EV manufacturing process.

This revolutionary process has allowed Arrival to have these micro-factories constructed and fitted out in 6 months compared to the 2 years that it normally takes for traditional automotive factories to be completed. The cost of building and fitting out an Arrival Micro-factory is approximately USD 40 million compared to the USD 1 billion required to build a traditional Gigafactory. The lower cost of construction and shorter development time means that EV micro-factories can be constructed closer to vehicle demand centres with increased opportunity for supply chain localisation.

The factories are designed in modules which allows manufacturing capacity to be scaled as demand for electric vehicles grows. This represents an efficient and cost effect means of creating a green-field EV manufacturing industry at the ASEZ. The use of robotics and automation to manufacture electric vehicles also presents the opportunity to create new high skilled and well-paying jobs in the field of mechatronics engineering ranging from degree qualified engineers to robotics and automation technicians who would be required to service the machines.

Example of Arrival EV microfactory

- **Modular design**
- **Build time of 6 months**
- **Use of robotics & automation**
- **Build cost of USD 40 million**

Figure 28: A manufacturing module of an Arrival Micro-factory in the United Kingdom

Using micro-factories to manufacture EVs at the ASEZ presents a unique opportunity to quickly and cost effectively attract investment and create jobs in this growing industry. Whilst the robotics and automation equipment may initially be imported, there exists a market opportunity in the medium to long term to manufacture this equipment locally in Cape Town.

7 EV Industrial Policy case study: Indonesia

Indonesia has been highlighted as a case study of EV manufacturing investment success due to the recent interest from Tesla to potentially set up an EV and battery manufacturing facility there. Indonesia has achieved this through a combination of attractive EV policies and incentives as well as capitalising on their large reserves of key minerals required in the manufacturing of lithium-ion battery cells. Strategic mineral reserves include tin, nickel, cobalt and bauxite all of which are used in the manufacturing of EVs.

With the world's largest reserves of nickel at 21 million tonnes, Indonesia was able to influence global mineral supply chains through banning the export of raw unprocessed ore exports of nickel and other key minerals in January 2020. This policy forced investment in local nickel ore processing plants by global EV investors keen to shore up mineral supply chains for battery manufacturing.

There are currently 41 smelter projects being constructed in Indonesia with more than half of them nickel smelting projects, according to Indonesia's mining ministry. Indonesia has 13 existing nickel smelting facilities with a combined input capacity of 24.52 million tonnes, which mostly produce nickel pig iron (NPI). Twenty-two nickel smelting plants are currently being developed with an estimated 46.33 million tonnes of input capacity. As a developing country that is also well-endowed with natural resources such as manganese, nickel, titanium, aluminium, copper and iron South Africa has many parallels with Indonesia and should maximise its position in global supply chains to encourage local processing and component manufacturing.

7.1. Indonesia EV manufacturing: Key policies & incentives

7.1.1. ACCELERATION OF BATTERY ELECTRIC VEHICLE PROGRAM FOR ROAD TRANSPORTATION

Indonesian Presidential Regulation No. 55 which came into effect in 2019 set out five main directives to accelerate battery electric vehicle (BEV) programs in Indonesia:

- Accelerating the development of the domestic BEV industry (including the use of local content)
- The provision of incentives (fiscal and non-fiscal)
- The provision of charging stations and regulating electricity tariffs for charging EVs
- Satisfaction of the technical requirements of EVs
- Environmental protection

7.1.2. TAX HARMONISATION SCHEME FOR PROMOTING EV INDUSTRY

Indonesian Government Regulation Number 73 came into effect in 2019 and provided further tax incentives for low cost green cars (LCGC), 4-wheeled motor vehicles that use full or mild hybrid technology, four-wheeled motor vehicle that uses flexible engine technology (Biofuel 100) and four-wheeled motor vehicle that uses plug-in hybrid electric, electric battery or fuel cell EV technology.

7.1.3. TAX HOLIDAY, TAX ALLOWANCE AND SUPER DEDUCTION TAX

The Indonesian Government provides investment incentive opportunities for incoming investors in the sector. A series of fiscal incentives are available, from tax allowance and tax holiday to super deductible tax. Industries that are eligible for these for these incentives are:

- 4-wheeled or more automotive vehicle industry
- Automotive spare part and accessory industry
- 2 or 3 wheeled motorbike components and equipment industry

8 Atlantis Special Economic Zone: Key policies & incentives

8.1. Designation of ASEZ by the dtic

The ASEZ was established as part of an initiative by the City of Cape Town, Western Cape Government and GreenCape to establish a green-tech manufacturing hub in Atlantis, with a focus on manufacturing of green technology products. This initiative was in response to the Department of Energy's REIPPPP and the need for the local manufacturing of solar panels and wind turbines.

Green-tech refers to green technologies that reduce or reverse the impact of people on the planet. This includes renewable energy technologies such as wind turbines, solar panels, insulation, biofuels, EVs, materials recycling and green building materials. The hub has already attracted its first large green-tech investor, Gestamp Renewable Industries (GRI). A wind tower manufacturer, GRI has already invested R300 million and is in full-scale production.

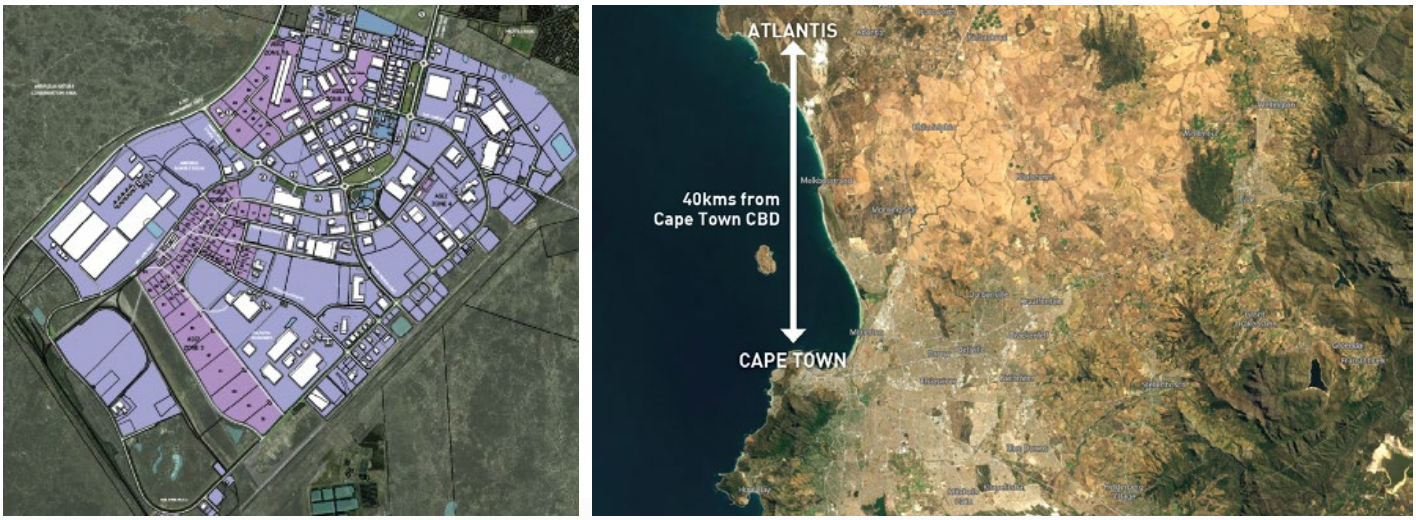


Figure 29: The ASEZ Masterplan and a map of the site in relation to nearby seaports

Localisation of manufacturing and the resultant job creation is one of the key priorities of Government through the REIPP programme. Situated on the West Coast of South Africa, 40km from Cape Town, the ASEZ capitalises on the province's already booming renewable energy and green technology sector. The development of an electric vehicle manufacturing industry at the ASEZ aims to expand upon this initiative to create much needed employment in the region.

The Atlantis Special Economic Zone offers 70 fully serviced sites connected with a series of interconnecting roads, capable of carrying both light and abnormal loads, with great proximity to major transport networks, providing easy access to neighbouring provinces, domestic electric bus markets and international ports for export.

Located between two large sea ports namely the Port of Cape Town (40km) and the Port of Saldanha (100km) the ASEZ is ideally located for easy export into Sub-Saharan Africa and other export markets. This ease of access allows for cost effective and rapid import of sub-components and machinery and export of manufactured/assembled EVs.The ASEZ Company seeks out export-orientated industries to co-locate and benefit from the ASEZ Company's offering of streamlined and efficient business activity.

Optimal manufacturing environment

Newly built 90 mVA substation with ample supply available

City of Cape Town supply area - curtailment measures in place reducing impact of load shedding

Expert facility design and construction services

In-house planning and design reducing costs and improving efficiency.

Fenced and secure land

Providing protection to your manufacturing activity

Purpose built facilities

Designed and delivered to investor specifications

Water supply

Designed to cater for multiple industries with a view to resource efficiency in its use.

Access Controlled Industrial Park

24 hour controlled access into zone

Fire suppression

Increased water pressure to ensure compliance with insurance companies.

Internationally competitive telecommunication infrastructure

Fibre and reliable broad band internet connectivity

High tech business development center and amenities

Efficiently operation providing 'incubation' services and identifying supply chain opportunities in behalf of ASEZ tenants.

Expert business development team

Providing suitable international market insight for expansion of your business and manufacturing activity.

Renewable energy generation

Provision of renewable energy from solar PV initially with Wind and other sources coming online in the future.

Industrial symbiosis

Resource identifications and linkage creation brokering synergies between ASEZ investors increasing internal competitiveness and your company's triple bottom line.

8.2.
Fully funded custom built factory within the ASEZ

The ASEZ would fund the development of the manufacturing facility top structure of prospective electric vehicle OEM's that wish to set up manufacturing facilities within the precinct. The ASEZ boasts expert facility design and construction services with in-house planning and design to reduce costs whilst improving efficiency. It is envisioned that all new factories will include the development of a rooftop solar PV installation to offset a portion of the energy requirements for manufacturing.

All new factories in the ASEZ will be fitted with a solar roof installation to offset a portion of the energy requirements.

8.3.
Energy sustainability and security within the ASEZ

The manufacturing facility top structure that would be built for prospective electric vehicle OEMs would comprise of a rooftop solar installation with BESS. This combined with other planned renewable energy projects for the ASEZ (such as Solar PV etc.) would ensure that electric vehicle manufacturing would be powered by clean renewable energy with the added advantage of energy storage facilities to provide all round energy security for up to 4 hours of production. In addition, the ASEZ benefits from a City of Cape Town supply area curtailment scheme with measures in place to reduce the impact of load shedding on manufacturing activities. A new 90 mVA electricity substation has also been built in Atlantis to ensure adequate electricity supply to tenants of the ASEZ.

8.4.
Financial benefits of being located within the ASEZ

The South African Department of Trade, Industry and Competition ASEZ strategy, provides a package of incentives:

- VAT and customs relief, if located within a Customs-Controlled Area (CCA);
- the employment tax incentive;
- a building allowance;
- and a reduced corporate income tax rate.

Businesses operating within approved ASEZ's will be eligible for two additional tax incentives.

- Firstly, all such businesses can claim accelerated depreciation allowances on capital structures (buildings)
- Reduced corporate tax rate (i.e. 15% instead of 28%).

8.5.
Promotion of skills development

The Western Cape is home to four internationally acclaimed universities in close proximity, which have produced some of the world's most innovative research. The ASEZ has identified these universities as strategic partners to undertake critical research and share knowledge of the most innovative green technology solutions currently available. This network of universities:

- University of Cape Town
- Stellenbosch University
- University of the Western Cape
- Atlantis TVET College
- Cape Peninsula University of Technology

The ASEZ could consider funding a skills development programme for fitters and turners / auto electricians if electric vehicle OEMs agree to a long term lease with the ASEZ and if the overall demand for said skillset in the foreseeable future is significant enough to justify such expenditure.

8.6.
Automotive Investment Scheme (AIS)

A non-taxable cash grant of 20% of the value of qualifying investment in productive assets for original equipment manufacturers (OEMs) and 25% of the value of qualifying investment in productive assets for component manufacturers and tooling companies, as approved by the dtic:

An additional non-taxable cash grant of 5% may be made available for projects that maintain their base-year employment figure throughout the incentive period, and achieve at least two of the following economic requirements:

- Tooling
- Research and development in South Africa
- Employment creation
- Strengthening of the automotive value chain
- Value addition
- Empowerment

To qualify for an additional grant of 5% (cumulative 10%), the project must demonstrate:

- in respect of light motor vehicle manufacturers, a specified increase in unit production per plant; and
- in respect of component manufacturers, a specified increase in turnover and the manufacturing of components that are currently not manufactured in South Africa.

8.7.
People-Carrier Automotive Investment Scheme (P-AIS)

The P-AIS is a sub-component of the AIS and provides a non-taxable cash grant of between 20% and 35% of the value of qualifying investment in productive assets approved by the dtic.

Complete-Knocked-Down (CKD) vehicle assembler:

- CKD investments with a start production from 1 April 2015 onwards may qualify for a grant of 20%.
- For an additional 5%, the project must demonstrate that the investment will result in the maintenance of base-year employment levels throughout the incentive and model phase-out periods.
- For a second additional 5% bonus grant (cumulative 10%), the project must meet the set economic benefit criteria.

Component manufacturers

- Component manufacturers may qualify for a grant of 25% of the qualifying investment costs.
- For an additional 5%, the project must demonstrate that the investment will result in the maintenance of base-year employment levels throughout the incentive period and achieve at least two of the set economic benefit criteria.
- For a second additional 5% (cumulative 10%) P-AIS grant, the project must meet the set economic benefit criteria.

9 Conclusion

9.1. Recommendations to the ASEZ - EV Manufacturing Investment

The following segments of the EV manufacturing value chain have been identified as high potential investment opportunities which have been linked to industry stakeholders based both locally in the Western Cape and globally. Each opportunity has been accorded an appropriate timeline of implementation based on market readiness and consumer demand. The level of skill required for the jobs created per industrial opportunity has also been given a rating on a scale of 1 (low skill required) to level 5 (high skill required). The industrial investment required to create an industry at the ASEZ for each identified opportunity has also been rated from 1 (Low investment required) to 5 (high investment required).

Table 2: Recommendations to the ASEZ - EV Manufacturing Investment

EV Market Segment	Electric Vehicle Value Chain	Investor Target for ASEZ	Timeline	Skills Required	Industrial Investment Required
Electric Passenger Vehicle	Assembly	Tesla, SAIC, VW, BYD, Hyundai, Mini Cooper, Porsche, Jaguar and Audi	Medium to Long Term	4	4
Electric Kick-Scooter	Assembly	Electric Life Rides	Short Term	3	3
Electric Bicycle	Assembly	Green Riders	Short Term	3	3
Electric Moped	Assembly	Go-Electric	Short Term	3	3
Electric 3-Wheeler	Assembly	MellowVans	Medium Term	4	4
Electric Mini-Bus Taxi	Assembly	Flx EV	Medium Term	4	4
Electric Bus	Assembly	BYD	Medium Term	4	4
Electric Truck	Assembly	Scania	Medium to Long Term	4	4
Battery Pack	Component Manufacturing	Polarium, SolarMD, BlueNova, Balancell	Short Term	4	4
Battery Cell	Component Manufacturing	i-G3N, Metair BritishVolt, NorthVolt, CATL, LG Chem, Panasonic, BYD, Samsung and SK Innovation	Long Term	5	5
Electric Vehicle Skateboard Platform	Component Manufacturing	Canoo, Rivian, REE Auto, Karma	Medium to Long Term	5	5
Automotive Glass	Component Manufacturing	Shatterprufe	Short Term	2	2
Automotive Plastic & Composite Materials	Component Manufacturing	GeMotoSA, Ebor Automotive Systems, Finke Plastics, Injemo Engineering and Plastic Products	Short Term	2	2
Tyres	Component Manufacturing	Continental, Firestone, Pirelli, Michelin, Goodyear	Short Term	3	3
Semi-conductors	Component Manufacturing	TSMC, UMC, SMIC, Samsung, Global Foundries, Hua Hong Group, Vanguard, PSMC, Tower Semi	Medium to Long term	5	5

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GreenCape

atlantis special economic zone cape town

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