INDUSTRY BRIEF

Driving down delivery costs

Electric two- and three-wheelers in South African last-mile delivery

atlantis special economic zone cape town

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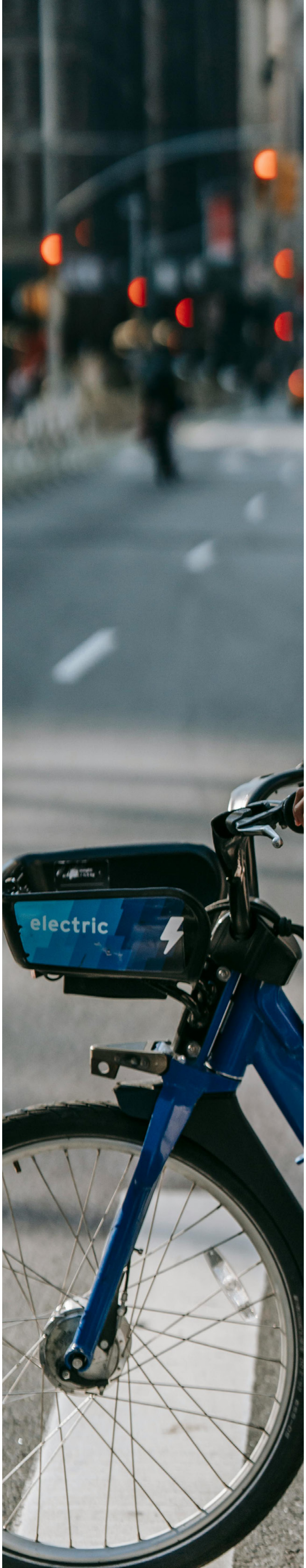
GreenCape



This brief provides insights for transitioning to electric last-mile fleets, focusing on the total cost of ownership optimisation, operational feasibility, and emissions reduction.

This industry brief is written for

South African businesses and organisations operating or depending on last-mile delivery fleets. This includes delivery platforms, retailers with in-house logistics, courier, and fleet management firms.

Main insights

ECONOMIC VIABILITY: Electric micro-mobility is already commercially viable in last-mile delivery applications. The strongest business case is on short-distance, high-frequency urban routes where high utilisation improves operational savings by up to ~50% against internal combustion engine (ICE) motorcycles.

CAPITAL EXPENDITURE (CAPEX) VS. OPERATING EXPENDITURE (OPEX): Higher upfront cost remain a challenge. The cost can be offset by adopting a stepped solution that replaces ICE motorcycles at the end of their operating life, or by adopting financing and service-based models like leasing, battery-as-a-service (BaaS) and electric vehicle-as-a-service (EVaaS).

OPERATIONAL EFFICIENCY: Battery swapping can effectively reduce charging downtime and maintain delivery performance.

ENVIRONMENTAL, SOCIAL AND GOVERNANCE (ESG) INTEGRATION: Transitioning to electric micro-mobility offers a measurable pathway to reduce delivery-related emissions by approximately 40-60%, supporting Scope 1 or Scope 3 reporting, however, South Africa's reliance on coal-based power necessitates the integration of renewable energy in charging infrastructure.

Sustainable Development Goals (SDG) alignment

7 AFFORDABLE AND CLEAN ENERGY

8 DECENT WORK AND ECONOMIC GROWTH

List of acronyms

AMID	Association of Motorcycle Industry Distributors
BAAS	Battery-as-a-Service
CAPEX	Capital expenditure
E2W	Electric two-wheeler
E3W	Electric three-wheeler
E-BIKE	Electric bicycle
ESG	Environmental, social and governance
EV	Electric vehicle
EVAAS	Electric vehicle-as-a-service
ICE	Internal combustion engine
NMD	Notified Maximum Demand
OPEX	Operating expenditure
PV	Photovoltaic
SDG	Sustainable Development Goals
TCO	Total cost of ownership
TOU	Time-of-use

Market context

The South African last-mile delivery landscape is undergoing a structural shift. In 2025, the local motorcycle market reached a ten-year peak, with 43 144 new units sold, of which 70% were for commercial use[1]. This surge is driven by the growth of on-demand grocery and e-commerce platforms.

Reliance on ICE motorcycles exposes operators to volatile fuel prices, higher maintenance costs and increasing pressure to reduce emissions across value chains. As corporate ESG mandates become more stringent the decarbonisation of highly visible and high-frequency delivery routes is becoming a strategic priority for retailer and logistics leaders.

1 These numbers were informed by the Association of Motorcycle Industry Distributors (AMID)

Vehicle types and use case fit

Vehicle selection is determined by payload, volume, and route density. Table 1 outlines the standard segments currently available in the South African market.

Table 1: Vehicle capability and use cases

Vehicle type	Typical use case	Payload capacity	Typical range per charge	Operational advantage
E-bikes (electric bicycle)	Dense urban / township delivery	< 150 kg	< 80 km	Lowest entry cost, ideal for short range trips.
Electric two-wheeler (E2W) (Electric motorcycle / scooter)	On-demand food & grocery deliveries	120–180 kg	80–150 km (battery-dependent)	Dominant segment, flexible routing, short-middle distance trips.
Electric three-wheeler (E3W) (three-wheeler cargo vehicles)	Bulk parcels, structured routes	250–400 kg	80–130 km	Increased stability and volume, bridges the gap to light commercial vehicles

The South African market is already supported by a growing base of local distributors and manufacturers. These vehicle providers are supported by a broader ecosystem that includes fleet operators, delivery platforms, energy providers, and financing partners. Note: List is non-exhaustive and inclusion does not imply endorsement; operators should conduct independent due diligence.

E-bikes: Green Riders ; Stroom

E2W: EWIZZ ; ScootHero ; Valternative ; Nova Moto

E3W: MellowVans ; Green Scooter

Source: Green Riders

Economics: Energy and operating cost savings

Delivery vehicles typically operate for extended hours each day, making operating costs the primary driver of total cost of ownership.

While E2Ws typically have higher upfront purchase prices than ICE motorcycles, this cost difference is offset over time through lower energy and maintenance costs. ICE delivery motorcycles typically range from R17 000 to R60 000, while E2Ws typically range from R45 000 to R135 000 depending on specification and battery configuration. Indicative modelling suggests that E2Ws can reach break-even within seven to 24 months, depending on utilisation, maintenance costs and financing structure. When considering energy costs alone, the reduction is significantly higher due to the lower cost of electricity relative to petrol, as shown in Table 2. Evidence from supplier data and industry case studies indicates total opex reductions of approximately 30-50% per kilometre compared to ICE motorcycles under typical delivery conditions. E3Ws typically cost between R120 000 and R250 000 and serve a more specialised delivery segment, carrying larger or heavier goods on structured routes.

Source: Green Riders

Table 2: Indicative energy cost comparison for two-wheel vehicles[2]

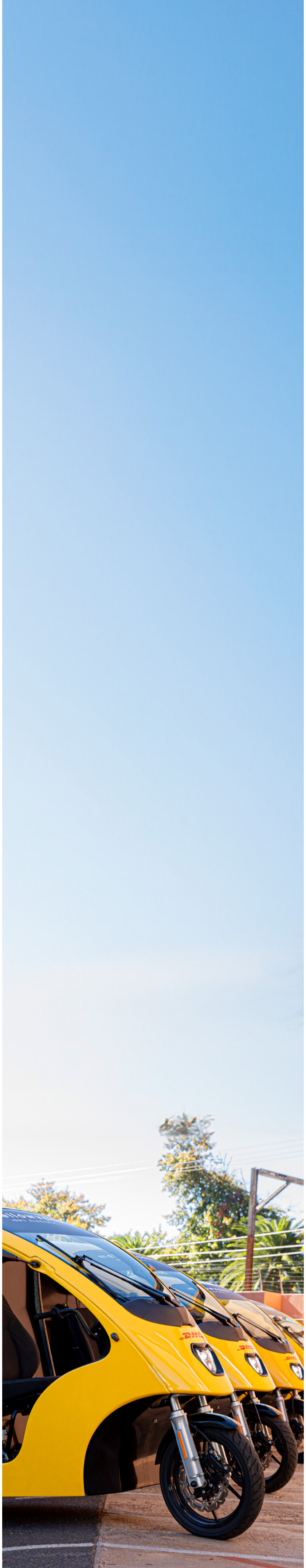
Metric	ICE Motorcycle	E2W
Fuel / electricity use	3.0–3.5 L / 100km	3.5–4.5 kWh / 100km
Travel cost	R0.78–R0.91 /km	R0.10–R0.12 /km
Energy volatility	High (fuel price fluctuation)	Low (regulated tariffs and charging strategy)

The high capital cost makes investment into large EV fleets a challenge. A phased approach could be considered, replacing ICE motorcycles at the end of their lifespan with EVs or utilising financial levers.

The available levers to improve the economic case are:

- **Leasing and rent-to-own models:** These models enable access to vehicles without upfront capex, often through structured daily, weekly or monthly payments.
- **Battery-as-a-Service (BaaS):** By separating the battery (the most expensive component) from the vehicle, operators can reduce upfront capex and battery ownership risk.
- **Electric Vehicle-as-a-Service (EVaaS):** This model bundles the vehicle, battery, maintenance, insurance and sometimes charging into a single monthly usage-based fee. This shifts capex into opex and improves cost predictability.
- **Renewable energy integration:** Charging via on-site renewable energy, such as solar photovoltaic (PV), or utilising energy wheeling for larger charging hubs, can effectively "lock in" energy costs for 20 years, immunising the fleet against future tariff hikes.

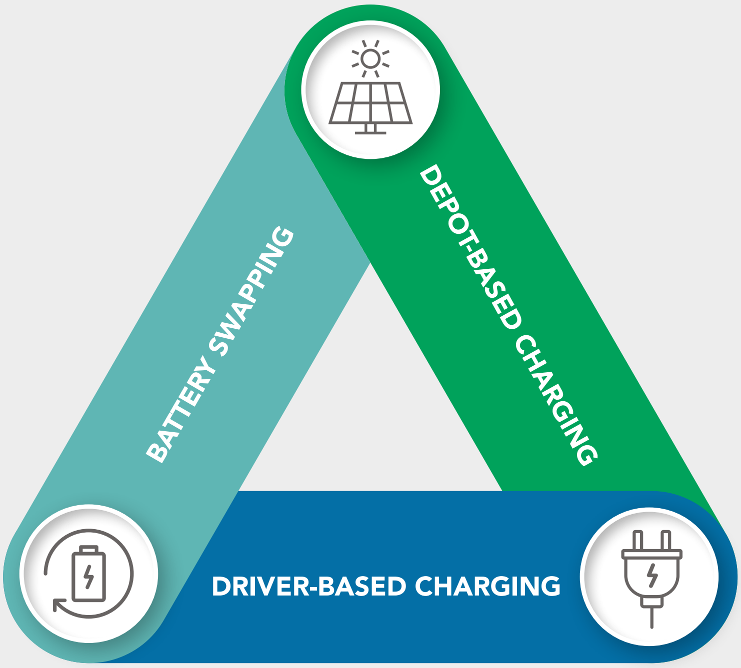
2 These estimates are based on the following assumption: A petrol price of R26.11 per litre (May 2026 price); electricity tariff of ~ R2.75 per kWh (City of Cape Town's large user low voltage tariff, standard rate); and distance travelled of 100km per day. Actual costs will vary depending on vehicle specifications, energy sourcing, and operational design.



Operating considerations and risk mitigation

Successful deployment requires an integrated management strategy. Unlike ICE vehicles, electric fleets require a more integrated approach to charging, scheduling, and energy management.

Successful charging strategies are:



DEPOT-BASED CHARGING, which offers more control and lower costs, particularly when combined with solar PV or time-of-use (TOU) tariffs.

DRIVER-BASED CHARGING, which is flexible but less controlled in terms of cost and behaviour.

BATTERY SWAPPING, which is increasingly used to minimise downtime, allowing fleets to maintain near-continuous operation by eliminating charging delays.

Dedicated driver hubs are emerging to support the last-mile delivery segment in major metropolitan areas to improve efficiency and support high vehicle utilisation. These aim to integrate charging, battery swapping, storage and driver facilities.

Risks & mitigation

While the business case for E2W and E3W is increasingly strong, operational and financial constraints remain. These are manageable with the right deployment model, summarised in Table 3.

Table 3: Key EV adoption risks with mitigation approach

Risk	Implication for fleet operator	Mitigation approach
High upfront cost	Limits adoption, particularly for smaller fleets or owner-drivers.	Use leasing, rent-to-own, BaaS and EVaaS models to reduce upfront cost and align payments with usage.
Load shedding and strained grid reliability	Disrupts charging schedules and affects fleet availability.	Integrate solar PV, battery storage or battery swapping models to reduce reliance on grid availability. Geographic distribution of charging stations allow for shifting between load shedding areas.
Limited access to charging infrastructure	Charging loads can increase demand on strained connection infrastructure. This may also reduce uptime and limit operational flexibility.	Implement depot-based charging, battery swapping systems aligned to delivery schedules, or utilise shared charging infrastructure such as driver hubs. Implement on-site solar PV and battery systems to offset the grid demand.
Unsuitable electricity tariffs	Some TOU tariffs incorporates increased costs and penalties for demand increases, such as through Eskom's Notified Maximum Demand (NMD) charges.	Model the charging impact on electricity tariffs and develop a strategy to either mitigate the impact or changing the tariff structure with the electricity distributor.
Theft of vehicles or battery units	There is a high risk of material loss of battery packs, resulting in significant operating and financial losses.	Having insurance in-place to cover theft. The risk should be reduced through incorporating safe storage areas and tamper-proof mechanisms. Recovery of equipment through tracking and remote immobilisation.
Battery lifecycle and replacement cost uncertainty	Battery degradation affects long term cost and reliability.	Implement good battery management practices or use BaaS to offset the cost of batteries.
Limited standardisation and supplier dependent maintenance	Reliance on specific suppliers for parts, including batteries, could delay or increase the cost of maintenance or repairs.	Select suppliers that provide service agreements that include uptime guarantees, parts access, and maintenance support.
Rider adoption and training	Operational performance may be affected during transition.	Utilise supplier led driver training programmes (e.g. Stroom, GreenRiders).

Source: Ulrich Terblanche

These constraints are manageable with the right operating model. In most cases, successful adoption depends on how the fleet is structured, rather than the technology itself.

Fleet operators that combine:

- the right vehicle for the use case,
- an appropriate financing model, and
- a practical charging solution,

can overcome these barriers and realise the cost and efficiency benefits of electrification.

Environmental impact and ESG reporting

Electrification is the single most effective lever for reducing carbon emissions in vehicle fleets, however, South Africa's reliance on a coal for electricity generation necessitates the need to incorporate renewable energy within charging infrastructure to provide substantial carbon emission reduction. A typical comparison based on SA conditions shows are summarised in Table 4.

Table 4: Indicative emissions comparison

Fuel/charging source	Energy use assumption	Emission factor	Emissions per 100 km
Petrol for ICE	3.0–3.5 L / 100km	2.3 kg of CO_2 per litre[3]	6.9–8.1 kg CO_2
Grid electricity for E2W	3.5–4.5 kWh / 100km	0.9 to 1.0 kg of CO_2 per kWh[4]	3.2–4.5 kg CO_2
Renewable energy integrated charging for E2W	3.5–4.5 kWh / 100km (50–100% solar share)	Solar share: 0 kg of CO_2 per kWh; Grid share: 0.9 to 1.0 kg of CO_2 per kWh	0–2.3 kg CO_2

3 Standard fuel combustion emissions factor
4 South Africa grid emissions factor

Recommendations for fleet operators

- **Start with high-utilisation vehicles on defined routes:** Prioritise routes covering >100 km per day to accelerate the payback period.
- **Evaluate infrastructure early:** Assess the electrical capacity and depots before scaling.
- **Pilot technology:** Battery swapping and other technologies should be tested for viability prior to large-scale rollout.
- **Leverage financing:** Explore leasing, BaaS and EVaaS to maintain balance sheet liquidity.

This industry brief was made possible with the support of ClimateWorks.

Useful resources

Naspers / Prosus (2024) Electrifying Progress: South Africa Report.
Prosus (2023) Powering Progress: Accelerating the Shift to Electric Mobility
GreenCape (2025) Electric Vehicle Market Intelligence Report
GreenCape (2026) Solar PV to achieve decarbonisation goals without upfront capital

South Africa's shift toward electric last-mile delivery – with motorcycle sales reaching a ten-year high of 43 144 units in 2025, 70% of which were for commercial use – presents a growing manufacturing opportunity. The Western Cape is positioning itself to benefit from this growth. The province is developing the foundations of a micro-EV manufacturing cluster centred around the Atlantis SEZ, with support from industry, investors, development organisations, and academic institutions. The aim is to move from importing electric two- and three-wheelers to becoming a competitive hub for their design, assembly, and support. The opportunity extends beyond vehicle assembly to include battery integration, maintenance and repair networks, battery recycling, and materials reuse. As the ecosystem develops, it could improve spare parts availability, servicing capacity, and supply chain resilience for fleet operators. Rising demand from delivery platforms, retailers, and courier fleets strengthens the case for local manufacturing. Producing vehicles, batteries, and charging infrastructure locally could lower costs, reduce lead times, and improve supply chain reliability. For fleet operators and delivery businesses, this is a development worth watching. As local manufacturing capacity grows, it could improve affordability, maintenance support, spare parts access, and financing options tailored to South African conditions. Electric micro-mobility is already commercially viable in many use cases, and a stronger local industry would make it even more compelling.

For more information please email:
info@atlantissez.co.za or visit our website
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www.greencape.co.za

021 811 0250

info@greencape.co.za

greencape_za

@thegreencape

GreenCape

@greencape_za

42 Hans Strijdom Ave, Foreshore,
Cape Town, 8000