GreenCape

Electrification of last-mile delivery services:

A case study of Green Riders

1 Purpose

A Cape Town-based company is demonstrating the commercial viability of using electric bicycles in last-mile food and grocery delivery.

This case study describes the business case rationale and outcomes of Green Riders new electric bicycle fleet. The Cape Town-based company is one of the leading electric last-mile food and grocery delivery service providers in the Western Cape.

The COVID-19 pandemic has accelerated the rollout of on-demand food and grocery delivery services due to customers' preference for home deliveries. This has given rise to the popularity of food delivery platforms such as Uber Eats and Mr Delivery, with Bolt recently launching its own food delivery service in 2021.

This growth sector has now expanded to include the delivery of groceries with CheckersSixty60, Pick n Pay ASAP, Woolworths Dash and Airlift Express offering delivery services within an hour of making the order.

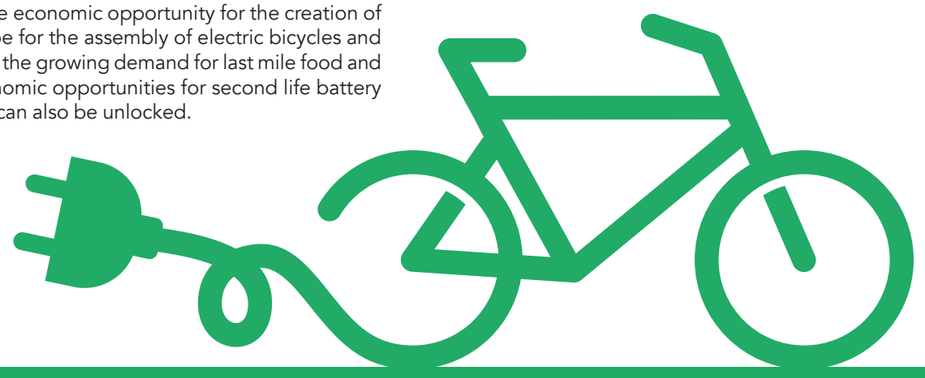
This case study aims to highlight the economic opportunity for the creation of new green jobs in the Western Cape for the assembly of electric bicycles and lithium-ion battery packs to support the growing demand for last mile food and grocery delivery. Downstream economic opportunities for second life battery storage applications and recycling can also be unlocked.

The Case Study discusses:

- The emerging business case for electric bicycles for last-mile food and grocery delivery in the Western Cape.
- How continued investment into green innovation strengthens the growth of local companies by providing an economic advantage over using ICE vehicles.
- The role that Micro-mobility can play with regards to sustainable last-mile logistics
- How partnerships can be mobilised to stimulate green and sustainable development through supporting innovation.

It is written for:

- Food and grocery delivery companies that are exploring cost-saving and sustainability measures.
- Businesses and entrepreneurs that are looking to capitalise on climate induced business opportunities.
- Cities and regions that are seeking to harness innovation and decentralised smart-city responses to climate change challenges.
- Cities and regions focused on building economic resilience with regards to rising fuel prices
- Funders and other organisations seeking to replicate similar programmes.



2 Key Insights

SOUTH AFRICA'S ONLINE FOOD DELIVERY INDUSTRY WAS WORTH

R10.49 BILLION

($713 MILLION) IN 2019, ACCORDING TO DATA PORTAL STATISTA.

WITH GROWTH ESTIMATED AT NEARLY **14% ANNUALLY**, IT WILL REACH A VALUE OF

R17.6 BILLION

BY 2023.

While the South African car industry suffered a 29% drop in sales in 2020, motorcycles weathered the COVID-19 pandemic much better and declined just 1%. **The year ended with 20 644 new motorcycles being retailed** compared with 20 862 in 2019.

> "Following the devastating effect that COVID-19 had on the South African economy during 2020, it would have been reasonable to expect the motorcycle industry to suffer along with everybody else. In some respects it did, but the pandemic had the **unexpected consequence of accelerating the ever increasing commercial delivery business** to the extent that the new motorcycle market declined by only 1% compared with the previous year."
>
> **– ARNOLD OLIVIER,**
> *National Director of the Association of Motorcycle Importers and Distributors (AMID)*

ACCORDING TO ENATIS, **THE LIVE MOTORCYCLE POPULATION IN**

THE WESTERN CAPE GREW BY 1 636 VEHICLES

FROM 85 126 IN 2020 TO 86 762 IN 2021 WHICH CORRELATES TO THE GROWTH IN MOTORCYCLE DEMAND.

10% conversion
of ICE motorcycles to electric bicycles in the Western Cape

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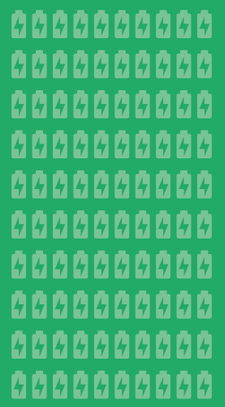
Potential market size of
8 676 e-Bikes



GREEN RIDERS HAS ASSEMBLED

100 ELECTRIC BICYCLES AND BATTERY PACKS LOCALLY

IN THE WESTERN CAPE

There is **potential to create an electric bicycle culture in South Africa** in a similar fashion to the growth of Boda Boda motorcycles in neighbouring African countries

This growth is based on a strong business case due to the operational cost savings achieved by switching from ICE motorcycles to electric bicycles.

3 What is Micro-mobility?

According to the Institute for Transportation and Development Policy (ITDP), **Micro-mobility is defined as**:

- Human-powered or electric
- Privately owned or shared
- Low (25km/hr) to moderate top speed (45km/hr)
- Bicycles
- Scooters
- 3 wheeler Rickshaws

4 Company Background

"Green Riders is a first-to-market e-bike delivery solution in South Africa, creating a sustainable business model for our stakeholders, providing a greener, more affordable solution to our clients and furnishing South Africa's youth with full-time job opportunities. **In just six months, we have created over 80 full-time jobs for the youth of South Africa**, and continue to create a minimum of three jobs a week, where youth are recruited through a number of different programmes"

– CRAIG ATKINSON,
Green Riders

5 Overview of the Electric Bicycle as a Service Model

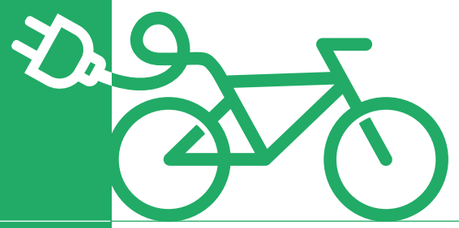
Green Riders operates an e-Bike as a Service Business Model as explained in the diagram below:

- Food and grocery delivery drivers pay a monthly lease for the use of an e-Bike
- Drivers can charge for free at the e-Bike depot (future expansion into distributed solar charging)
- A fully charged battery pack has a range of 100km
- Monthly maintenance & repairs on the e-Bike is included in the lease
- ViziCube cargo module is also used for advertising as an additional revenue stream
- The electric bicycles and battery packs are assembled locally in Cape Town which has led to the creation of over 80 new green jobs
- Electric bicycle fleet end of life stage will unlock future opportunities in the recycling and resource extraction industry especially with the recycling of lithium-ion battery cells

6 Challenge

THE CHALLENGE THAT IS BEING ADDRESSED BY THIS CASE STUDY IS THE ELECTRIFICATION OF LAST-MILE DELIVERY SERVICES TO ACHIEVE THE FOLLOWING OUTCOMES IN THE WESTERN CAPE:

- Decreased air pollution
- Meeting the greenhouse gas emission reduction targets of the Paris Climate Change Agreement, South African Green Transport Strategy and the Western Cape Government Electric Vehicle Strategy
- Decreased traffic and congestion
- Promoting industry resilience to rising fuel prices
- Decreasing noise pollution in cities
- Removing the high capital cost market entry barrier for drivers looking to enter the last-mile delivery market
- Removing the driver's license market entry barrier for people looking for meaningful job opportunities
- Creating electric vehicle assembly and component manufacturing opportunities in the Western Cape



7 Solution

E-BIKE SIZE:
Length 1.85m x height 1,2m

SPEED:
Governed accordingly to South African law (25.4km/h)

TORQUE:
80nm

RANGE:
100km

CHARGER:
AC 180v -240v

CHARGING DURATION:
5-6 hours per battery pack

8 Electric Bicycle Business Case

EXISTING ICE MOTORCYCLE	
Monthly ICE Motorcycle Rental	R2 400 to R2 800
Monthly Fuel Cost	R1 800
Monthly Service	R100
TOTAL	**R4 300 TO R4 700**

GREEN RIDERS ELECTRIC BICYCLES	
EV Vehicle Type	Electric Bicycle
EV fleet size	100 Operational Electric Bicycles
Electric Bicycle Rental	From R1 800 per e-Bike per month
Operational Saving	From R2 500 per month depending on the rental
Average Earnings per Drop	R25
Average Deliveries per Driver Day	11
Average Driver Income per Month	R6 930 on a 6 day work week
AVERAGE DRIVER PROFIT PER MONTH	**R5 000 depending on the rental structure**

9 Impact

GREEN RIDERS HAS IMPLEMENTED AN INNOVATIVE ELECTRIC BICYCLE AS A SERVICE BUSINESS MODEL WHICH HAS

OPENED MANY JOB OPPORTUNITIES

FOR DRIVERS IN THE LAST-MILE FOOD AND GROCERY DELIVERY INDUSTRY.

- A driver does not need to have a driver's license to ride an electric bicycle. This means that **a greater spectrum of people are now able to find meaningful employment** irrespective of whether or not they are a licensed driver.
- The **electric bicycle lease system** removes the high upfront purchase cost which would otherwise prevent drivers from accessing delivery job opportunities.
- Electric bicycles are quieter than their ICE motorcycle counterparts and this results in **less noise pollution** created.
- Switching to an electric bicycle protects drivers from rising fuel costs. Green Riders allows drivers to charge their bicycles at the depot for free as part of the electric vehicles as a service business model which means that there is **no added charging cost**.
- The Western Cape benefits from **a reduction in air pollution and greenhouse gas emissions** due to the switch from ICE motorcycles to electric bicycles. This not only contributes towards healthier cities but also assists in climate change mitigation.
- There is a **reduction in traffic congestion** due to electric bicycles taking up less space on the roads. In addition, electric bicycles are allowed to make use of bicycle lanes, where available, which promotes better traffic flow and faster delivery times.
- **Creation of job opportunities** in the assembly of electric bicycles and battery packs in the Western Cape.

10 Challenges and Barriers

- Electric bicycles are only suitable for last-mile delivery of small to medium packages which presents limited growth opportunities beyond food, grocery, pharmacy and small courier parcel deliveries.
- There is a lack of dedicated bicycle lanes across delivery demand areas which would result in drivers riding on the far left of the road, this may put drivers in conflict with motorists.
- There is a lack of suitable traffic crossings for electric cyclists wanting to cross busy roads which may put them in conflict with vehicle traffic.
- Second-life lithium-ion battery applications for stationary energy storage
- Lithium-ion battery recycling services and resource extraction

11 Opportunities for Development

The following represents areas for development and growth when exploring the impact of electric bicycles in the Western Cape:

- Electric bicycle component manufacturing in the Western Cape
- Long term manufacturing of lithium-ion battery cells in the Western Cape
- Distributed package delivery hubs throughout the CBD with solar charging stations and battery swapping facilities
- Second-life lithium-ion battery applications for stationary energy storage
- The creation of micro-mobility lanes in the Western Cape
- Lithium-ion battery recycling services and resource extraction

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