



Off-grid electrification
of mobility in Africa



Introducing South Africa's first off-grid national charging network for electric vehicles – powered by 100% renewable energy



UNIQUE SOLUTION

TARGETTING RURAL
AREAS, HIGHWAYS
AND MAJOR ROUTES

OFF-GRID

100% Grid independent – with no loadshedding or future growth restrictions.

NATIONAL

A charging station every 150km on all national and major routes.

ULTRA-FAST

Charging an EV to 80% in about 20 minutes with high power chargers.

100% RENEWABLE ENERGY

On-site power generation at each charging location.

CUSTOMER CENTRIC

User friendly app, easy payment options, fast WiFi, restrooms, shop.

KEY POINTS

- **South Africa will inevitably follow the trend** toward electric vehicles, considering that 19% of global vehicle sales are EVs, with a market share exceeding 42% in China. South Africa consumes less than 0.5% of the global production and is subject to global trends.
- The EV revolution is an energy play: EVs will require 10-15% **additional grid capacity** and even European electricity grids are sometimes struggling to supply power to EVs.
- **High powered (ultra-fast) charging** is the minimum viable standard in order to provide a ‘stop and charge’ experience roughly comparable with filling your car with petrol or diesel. In SA, with a weak grid and loadshedding, high power (ultra-fast) charging will require on-site power generation.
- In order to drive anywhere in SA, it is a **national requirement** to develop a network of charging stations, similar to that established by cell phone companies.
- In logistics, the “last mile to destination” is already electrifying and **driven by cost-savings and decarbonisation**.
- Smaller trucks and vans can be accommodated on the national CHARGE network. Large trucks run on more limited routes and **require route-specific solutions**, with vastly more charging capacity.

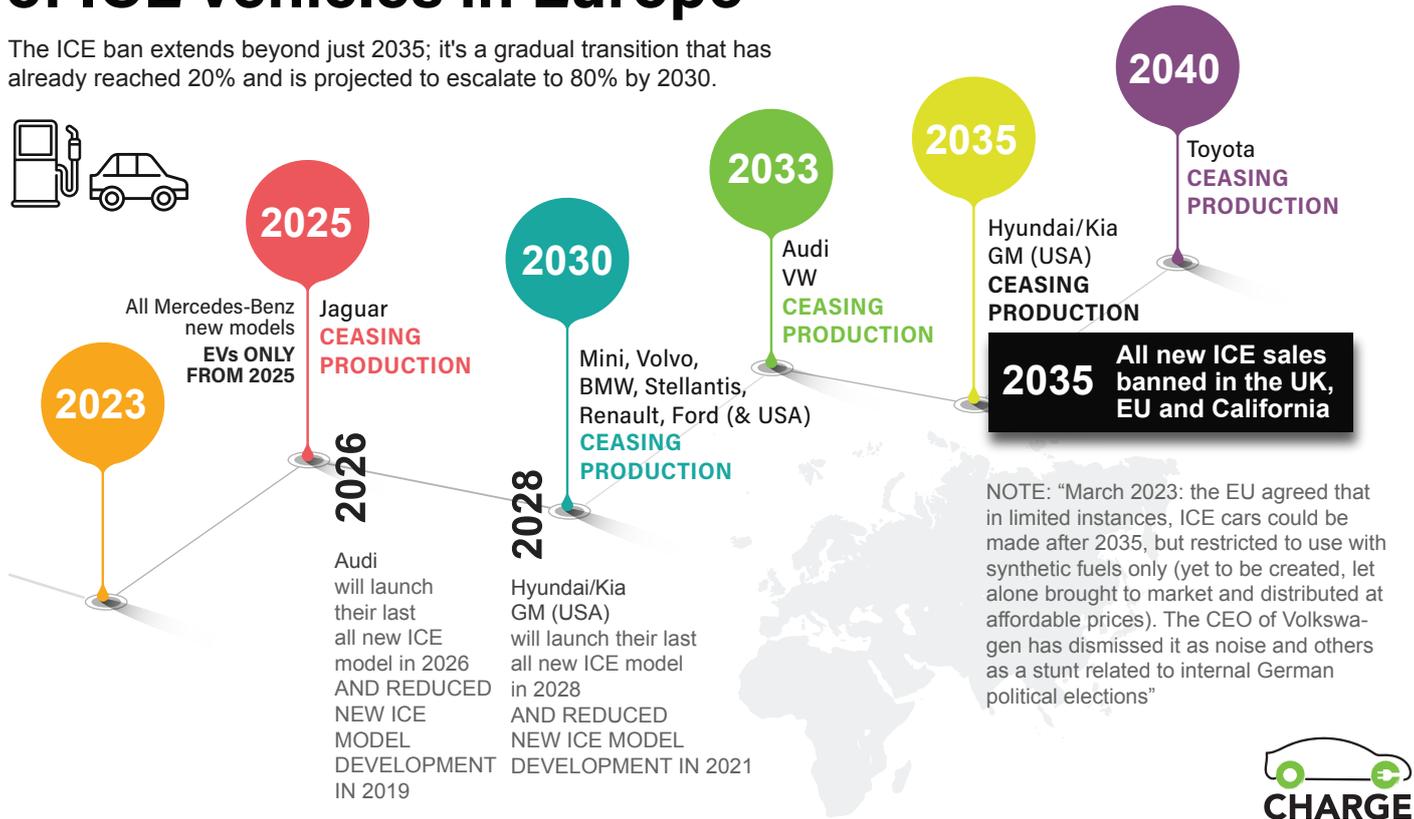
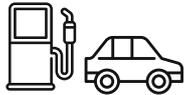


- We are following a modular approach by rolling out the **minimum viable product size** on a national basis.
- **Substantial, permanent import replacement:** annual spend on crude oil is R300 billion (US \$16 billion) (net of taxes) and localisation of manufacture: R44 billion (US \$2 billion) spent on PV panels, batteries, inverters and chargers over the next 10 years – all could be sourced in SA.
- Significant, **sustained economic impact** in rural areas.
- It's like a toll road: **big capex and small opex.**
- Completely green: **massive positive impact on the environment** since the footprint of an SA grid-charged EV is not much better than a diesel vehicle.
- **Low break-even number:** viable at 12 000 customers and 40 000 EVs in SA (of 10 million registered cars or trucks), lower breakeven on trucks.
- Very **strong financial returns** on both a project and an equity basis.



Manufacturers ceasing production of ICE vehicles in Europe

The ICE ban extends beyond just 2035; it's a gradual transition that has already reached 20% and is projected to escalate to 80% by 2030.



The SA motor industry is part of a giant integrated global supply chain. As the global chain pivots to EVs, South Africa's market will increasingly shift to EVs along with the markets of its major suppliers.

Having only a 0.5% share in the international car market, SA is inevitably bound to embrace the shift towards electric vehicles. This global move to EVs currently accounts for 19% of new car sales.



The localisation of energy production.

A MASSIVE IMPORT SUBSTITUTION EFFECT:

South Africa is spending well in excess of R300 billion a year on the importation of oil and fuel products for petrol and diesel vehicles of all kinds. As the use of internal combustion vehicles are phased out, there will be a significant decrease in Forex expenditure, resulting in the retention of that money within South Africa and enabling it to be reinvested in the economy.



Global EV uptake

2023

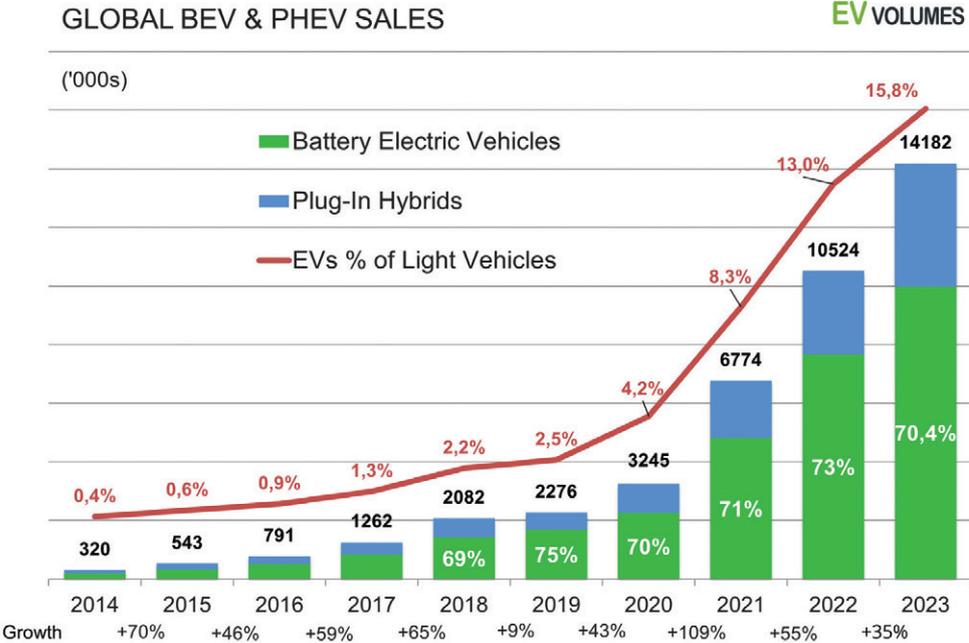
A total of 14,2 million new Battery Electric Vehicles (BEV) and Plug-in Hybrids (PHEV) sold

GLOBAL CAR MARKET

2020: EV = 5% market share
 2023: EV = 19% market share

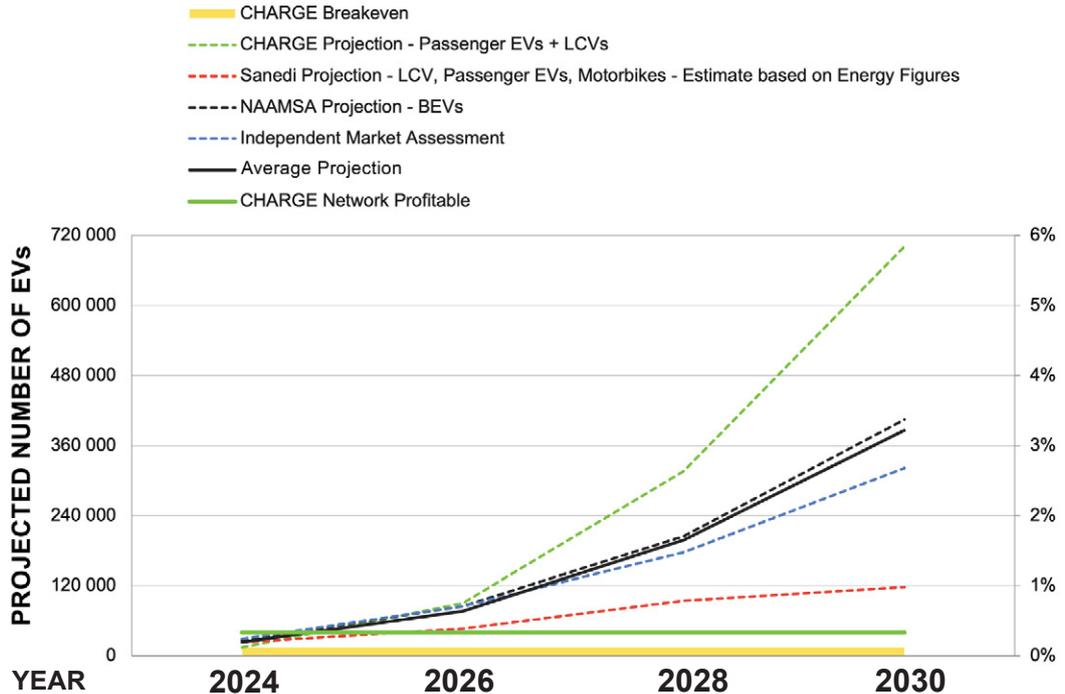
5 months of 2023 witnessed new all-time highs for EV sales, Market share increases were consistent throughout the year.

Investors have also maintained confidence in EVs, with the stocks of EV-related companies consistently outperforming traditional carmakers since 2019



SOURCE: EVvolumes.com

EV uptake projections for South Africa



'NAAMSA' National Association of Automobile Manufacturers of South Africa

'SANEDI' South African National Energy Development Institute

'PHEV' Plug-in hybrid electric vehicle

'LCV' Light commercial vehicle

'ENERGY CRISIS'

In South Africa grid powered EV charging presents fundamental problems

1. CARBON FOOTPRINT

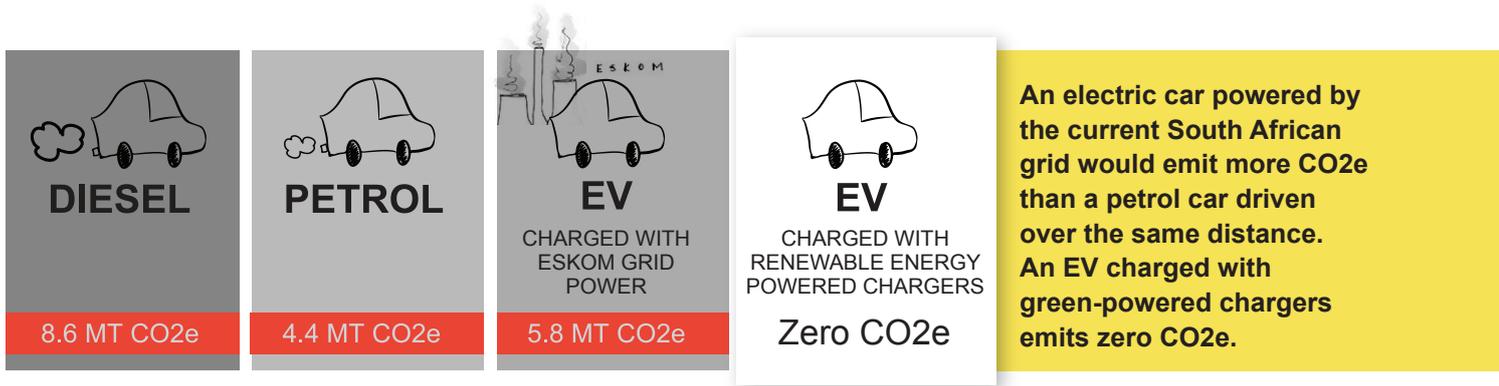
EVs are only as green as the power supply. SA grid's fossil fuel reliance inflates the carbon footprint of an EV.

2. UNRELIABLE SUPPLY

Eskom cannot for the foreseeable future be trusted to supply reliable stable power.

3. SHORTAGE OF SUPPLY

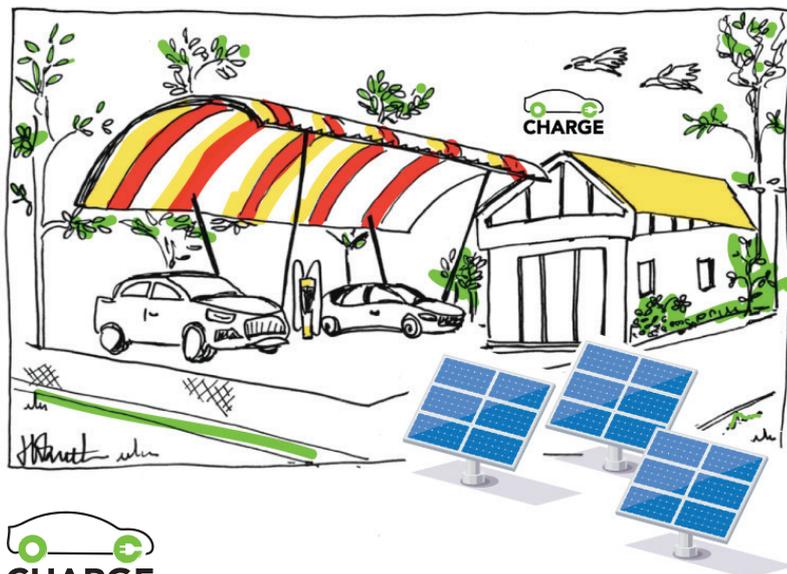
When the EV uptake escalates, Eskom will not be able to supply sufficient power.



Over average distance driven per year: 25 000 km (18 000 miles)

The CHARGE Network

120 OFF-GRID CHARGING STATIONS FOR
PASSENGER & COMMERCIAL VEHICLES UP TO 8 TONNES

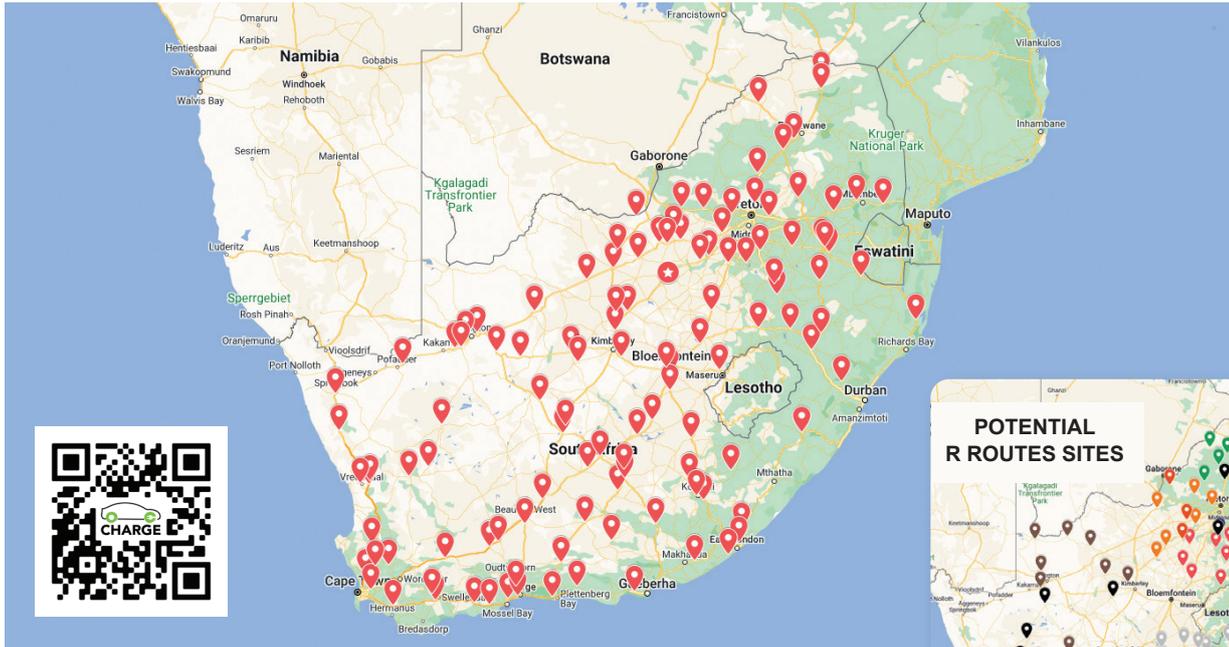


AT EACH CHARGING LOCATION

- 1** EV Charging Station
- 2** On-site power generation system – 100% renewable energy
- 3** Farm Stall
Parking Area
Restroom facilities
Botanical garden

MAP: 120+ SITES IN DEVELOPMENT

OFF-GRID CHARGING STATIONS FOR PASSENGER & COMMERCIAL VEHICLES UP TO 8 TONNES



PHASE 2:
Site expansion according to power demand & targeting more regional and urban routes.

THE CHARGE NETWORK ROLLOUT



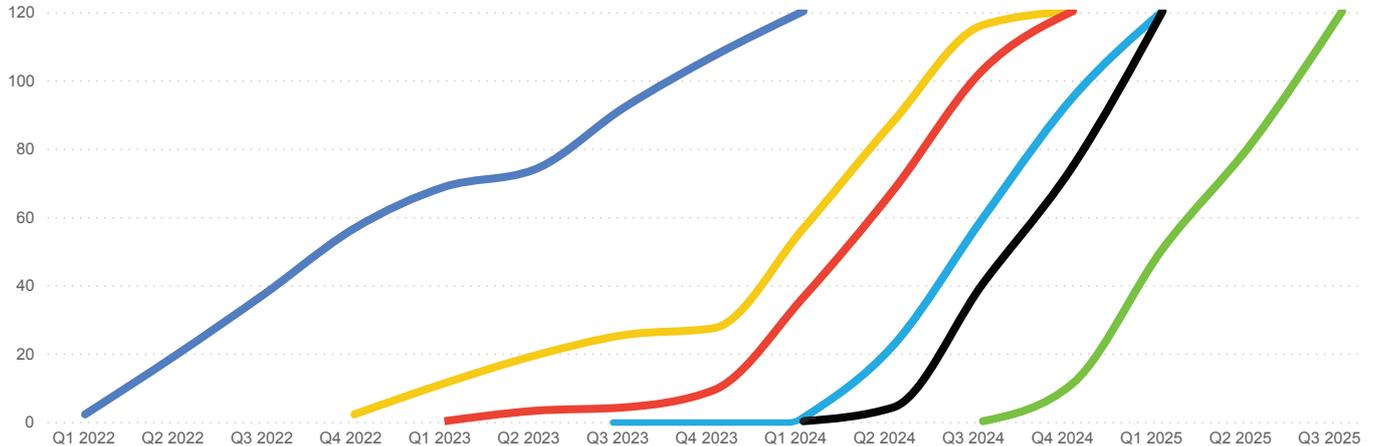
- Signed Option
- Public Participation Completion
- Architectrual Start
- Site Approval
- Construction Start
- Commissioned

CONSTRUCTING
120
CHARGING STATIONS

WITH
720
ULTRA-FAST CHARGE POINTS

READY TO SERVE
40 000
ELECTRIC VEHICLES

Accumulated Completion per Quarter





**Construction of the CHARGE network
started on 20 November 2023 on the N12.**

BACKED BY PROPRIETARY TECHNOLOGY:

Back office and app with seamless payment and integration that is manufacturer-agnostic.

A Charge Station Management System (CSMS) is a software platform that helps businesses manage their networks of EV charging stations.

It provides a centralized view of all charging stations, allowing operators to monitor their status, track usage, and manage revenue. CSMSs also play a vital role in load balancing and energy management.

The CHARGE e-Mobility platform also includes:

MOBILE APP

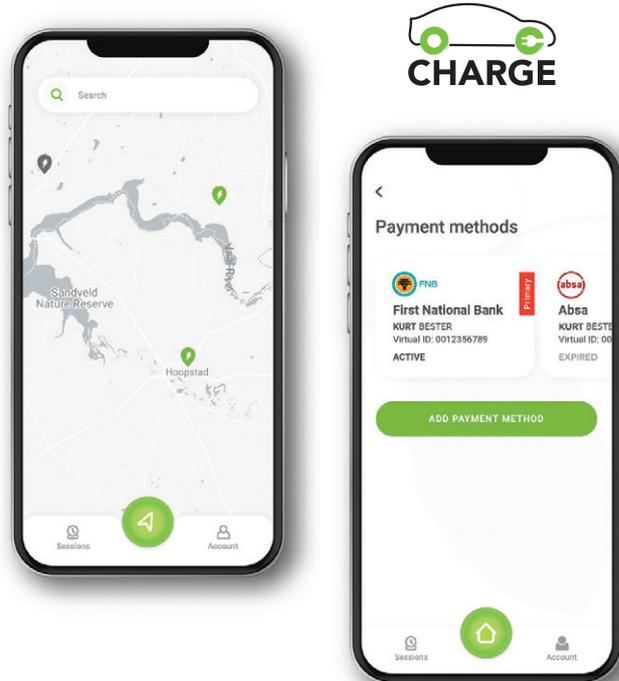
An intuitive app, designed to make your charging experience simple and enjoyable.

Charging Made Simple: Locate available charging stations with ease.

Charging Status: Monitor your EV's charging status on your phone.

Easy Payments: Seamless and secure transactions for a hassle-free charging experience.

OCPP Compliant: Using the Open Charge Point Protocol ensures compatibility with all charger hardware and software systems.



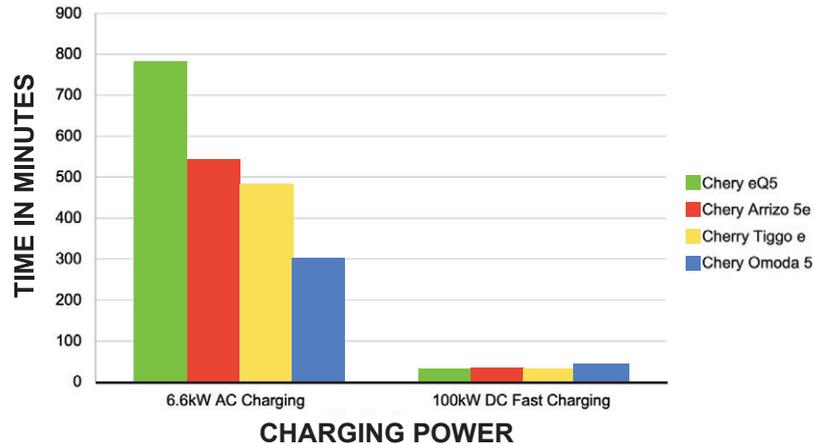
The superiority of fast charging is indisputable.



MINUTES TO CHARGE FROM 10% to 80%

	EQS	EQS SUV	EQE	EQC
22 kW	241,5	252	210	367,5
75 kW	63	64	60,5	50
300 kW	28	32	28	35

SLOW CHARGING VS FAST CHARGING TIMES



Hardware solution

Solar PV Energy Generation



Biofuel Backup Generator

Fuelled with hydrotreated vegetable oil



GREENCORE
ENERGY
SOLUTION



Containerised Battery Energy Storage System

- Lithium Batteries
- Power Conversion System
- Energy Management System

EV Charger

Power output
up to 480 kW

EV Charger Dispensers

- 3 dispensers with 2 connectors each
- Each dispenser has one liquid-cooled cable and one air-cooled cable
- Up to 500 A output per liquid-cooled connector
- Cable management system

**BOUNDARY
FENCE**

ACCESS GATE

**LOCAL ARMED
RESPONSE**

**ELECTRIC
FENCING**

**24/7
PROTECTION
365**

SECURITY



24/7 SURVEILLANCE CAMERAS

An off-grid network and uninterrupted electrical supply both at Zero Carbon Charge sites and at Sefrisat headquarters, in conjunction with the Sefrisat in-house control centre takes security to the next level.

Relationships with local armed response companies at each Zero Carbon Charge site are established to ensure minimal response time to incidents.



IMPACT ON SOUTH AFRICA

ENERGY LOCALISATION

Reduced reliance on foreign energy sources.

SOCIO-ECONOMIC IMPACT

Preservation of foreign exchange through decreased crude oil imports.

Creation of permanent jobs.

Boost to the local economy.

Significant contribution to convenience spending during vehicle charging.

Improved energy efficiency and reliability.

ENVIRONMENTAL IMPACT

Minimizing carbon footprint.

Contribution to climate mitigation efforts.

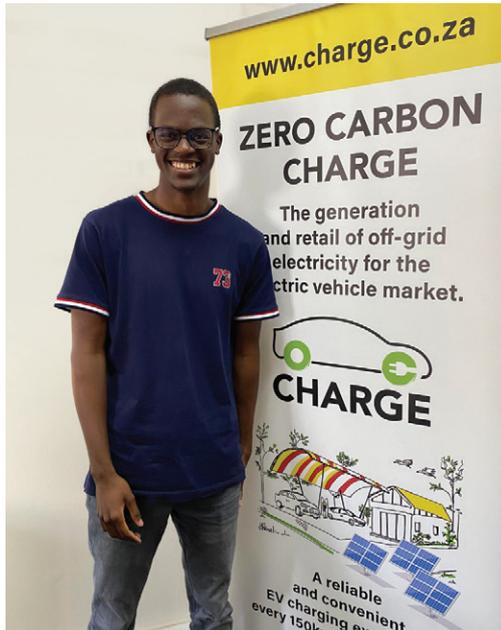
Improvement in air quality and respiratory health for all South Africans.

HUMAN RESOURCE DEVELOPMENT

Investment in community development and opportunities for underprivileged students.

IMPACT: Human Resource Development

Zero Carbon Charge will invest annually 1% of the project turnover back into the community.



CHARGE is privileged to provide internship opportunities to these bright young minds.

The Sumbandila Scholarship Trust is a highly successful educational initiative in South Africa that provides opportunities to academically talented students.

Since its inception in 2007, the Sumbandila Scholarship Trust has been ardently committed to alleviating educational disparities in South Africa.

These programs are designed to identify academically brilliant and motivated students from disadvantaged backgrounds and to support them on their educational journey, beginning at secondary school, through tertiary education, and into their professional careers.

They are dedicated to address South Africa's desperate need for high-quality scientists, engineers, doctors, and IT professionals, prioritising Math, Science, Engineering, and Technology education. As a result, a significant proportion of their students (23%) study in Science faculties, 15% in Engineering, 6% in IT, and 19% in Health Sciences.



www.sumbandila.org

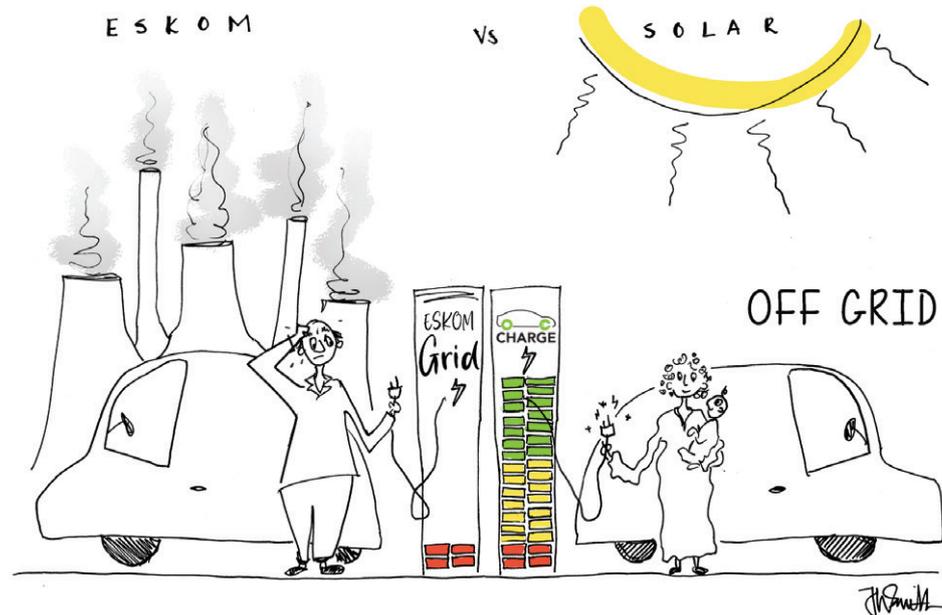
ENVIRONMENTAL IMPACT

Zero Carbon Charge is projected to produce **17 million + carbon credits** over the next twenty years.

Each EV recharged with Zero Carbon Charge green chargers will save on average 5.8 tons of CO₂e per year.

We project that by 2032 there will be 1,4 million EVs on SA roads.

That would directly save 9,1 million tons of CO₂e per year.



BUSINESS PLAN BUILDING BLOCKS

REGISTERED VEHICLES: 10 million

ANNUAL NEW VEHICLE SALES: 428 000

AVERAGE DISTANCE DRIVEN PER CAR PER YEAR:

25 000 km (18 000 miles)

ANNUAL RETAIL MARKETS

Petrol R245 billion

Diesel R255 billion

OUR TARGET MARKET

49% of the petrol market is consumed outside of the 15 largest cities and towns in SA – the area in which our charging stations are planned.

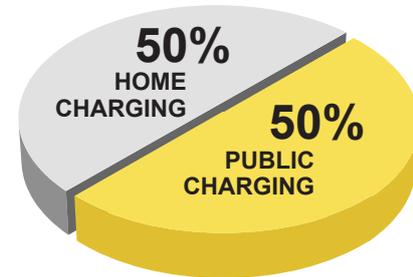
Home charging is expected to represent 50% of all charging, leaving 50% of charging market as public charging.

Of that 50% market share, 49% is assumed to be Zero Carbon Charge's target market.

We estimate the target market at R40 billion annually.

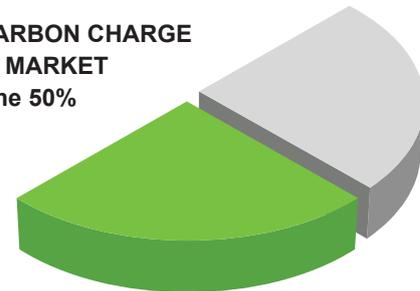
It is foreseen that as EV numbers grow, the home charging will decline as a % of the charging market due to local capacity constraints.

ASSUMPTIONS



ZERO CARBON CHARGE TARGET MARKET

49% of the 50%





TRANS-AFRICAN HIGHWAYS

OFF-GRID CHARGING STATIONS FOR LARGE ELECTRIC TRUCKS

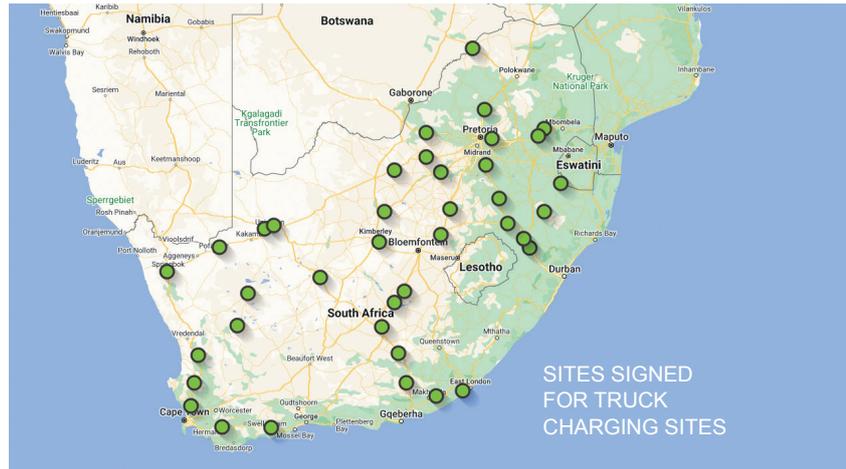


Africa has the world's greatest solar energy potential



ZERO CARBON LOGISTICS

THE LOGISTICS NETWORK
OFF-GRID CHARGING
STATIONS FOR LARGE
ELECTRIC TRUCKS



SITES SIGNED
FOR TRUCK
CHARGING SITES

EXPERTISE

The founders of Zero Carbon Charge have a unique perspective on electric car charging as a result of having more than a decade of experience in both renewable energy developments and in various motor retail interests (including Toyota).

They have signed up 100 000's of hectares all over the Northern and Western Cape and obtained the various environmental and usage rights required for both large- and small-scale wind and solar installations.

Currently they are co-owners of several fully permitted 200 MW wind farms, to be bid in Round 6 of the REIPP, partnering with ACED, a leading renewable developer ultimately owned by Old Mutual.



The motor retail interests span all the major manufacturers and are focussed predominantly on rural areas.

Conceptualising, sourcing, beneficiating, developing and funding a national network of ultra fast chargers with their own localised renewable generation facilities and understanding the business dynamics thereof is a natural consequence of these specific experiences.



Andries Malherbe
DIRECTOR & CO-FOUNDER

- Co-founded Zero Carbon Charge 2021
- Initiated and advised on largest secondary buyout (at that date) of a Windfarm in SA in 2018
- Co-founder and co-owner of multiple bid-ready windfarms, to be bid in Round 6 of the REIPP programme
- Since 2011 large-and small-scale wind and solar developer in partnership with Joubert.
- 2007 to 2011, Co-owner of car retail businesses and property interests
- 1991 to 2006, Naspers Group, Amsterdam, Johannesburg and Cape Town
- 1988 to 1991, Bankers Trust NY, USA
- 1986 to 1988, MBA, Stanford University, Fulbright scholarship
- BCom LLB, Stellenbosch University



Joubert Roux
DIRECTOR & CO-FOUNDER

- Joubert Roux is a serial entrepreneur with a proven track record in transportation. Over the last 3 decades, he has built up a network of service stations and car dealerships throughout the Southern, Western, and Northern Cape.
- Since 2011, Joubert has been developing wind and solar projects for the REIPP programme, in partnership with Andries.
- Joubert spent 10 formative years in the civil engineering industry with Grinaker-LTA and is experienced in the roll-out of big long-term construction projects.
- Apart from his interests in the motor industry he also has farming interests along the Olifants River. He was instrumental in working with previously disadvantaged communities in Ebenhaezer and Leliesfontein to establish micro-vineyards and boutique wineries.
- He is the founder of 1st Principles Distillery - one of few distilleries in SA driven by solar power.



ZERO CARBON HOLDINGS (PTY)LTD

ZERO CARBON CHARGE (PTY)LTD

ZERO CARBON SITES (PTY)LTD

ZERO CARBON LOGISTICS (PTY)LTD

Joubert Roux

Entrepreneur

Juanita vd Merwe - COO

Site Origination →

MANAGER

Mark du Plessis

CAR SITES

Adriaan Neethling

SITE OWNER

RELATIONS

Kareni Bester

Tharina Abell

→ **Environmental**

Applications

MANAGER

Anton Beukes

ENVIRO AFRICA

SPECIALISTS

→ **Architectural design**

And Management

SITE DEVELOPMENT

PLAN COORDINATION

Tamsyn Roos

DESIGN & BUILDING

PLAN APPROVALS

SKEP & Geraldine Heyns



Execution Management ←

PROJECT ELECTRICAL ENGINEER

Menelaos Meli

QS

Lucius Kriel

SCHEDULING & PROJECT PLANNING

Jeremy Janse van Rensburg

CONSTRUCTION SITE MANAGER

Hardi Boonzaaier

QUALITY CONTROL MANAGEMENT &

TECHNICAL CONTROL & OVERSIGHT

Land use Applications

Nical Grobbelaar

Northern Region

Infraplan

Noel Brownlee

Central Region

Mirinda de Beer

Southern Region

CK Rumboll & Partners

Information Control

Tim Sandham

CTO

Kurt Bester

Back office

Systems control

Payment interface

Government Relations

Larissa Venter

Mmathapelo Ramahuma

Commercial Transport

Judy Elston

Andries Malherbe

Funding, Money raising,
Oversight & Legal

**Business development,
modelling & due diligence**

Tim Heneck

Research & Carbon Credits

Julia MacMillan

**Financial Management
& Control**

Erma vd Westhuizen &
Aldene Visage

Auditors: ClaassenStone

Marketing

Design & look & feel custodian
Internal communication

Elmien de Wet

Illustrator & Social Media manager

Jennifer Worthington-Smith

**Corporate Affairs & Strategic
Communications / PR**

Larissa Venter

Ockham Communications

Gavin Davis & Trace Venter

Team Time

& Accessibility Manager

HR & Happiness Manager

Elizna Brand



This is to certify the Team at Zero Carbon Charge for successful completion of the ChargeSafe compliance workshop.

They have shown a keen understanding of best practices where Customer safety & accessibility in public charger design are concerned.

The training was completed in March 2023 and is valid for 24 months, in accordance with ChargeSafe guidance for an inclusive EV charge experience.

A handwritten signature in white ink that reads "Kate Tyrrell".

Kate Tyrrell, CEO of EV ChargeSafe Limited.

Certified Partner



ChargeSafe

Zero Carbon Charge



ALLIANCES FOR
**CLIMATE
ACTION**
SOUTH AFRICA

ZERO CARBON CHARGE

has joined the Alliance for Climate Action South Africa.

We are committed to playing our part
in achieving a zero-carbon future by 2050.



Do you own land next to a busy road with a safe turn-off?

PARTNER WITH US

Scan the QR code and join the tribe.



GET INVOLVED



PARTNER
WITH US



INVEST



LEARN
MORE



NEWSLETTER
SIGN UP



ZERO CARBON CHARGE (PTY) LTD

Reg Nr: 2022/232376/07
Enterprise Type: Private Company
Location: South Africa
Date founded: Nov 2021

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