AFRICA CLEAN MOBILITY WEEK 2018

UYILO E-MOBILITY PROGRAMME
enabling electro-mobility innovation

Hosted by:
NELSON MANDELA UNIVERSITY

An initiative of:
technology innovation AGENCY

Electric Mobility in Africa - *Promoting an enabling environment for electric mobility*

Wednesday 14 March 2018

Hiten Parmar
Director: uYilo eMobility Programme
www.uYilo.org.za

Mobility solutions in electric

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eMobility Infrastructure - Charging options

Mobile: Charge time 6 - 8 hours

Residential: Charge time 6 - 8 hours

Public: Charge time 1 - 6 hours

Public: Fast Charging 15 - 30 minutes

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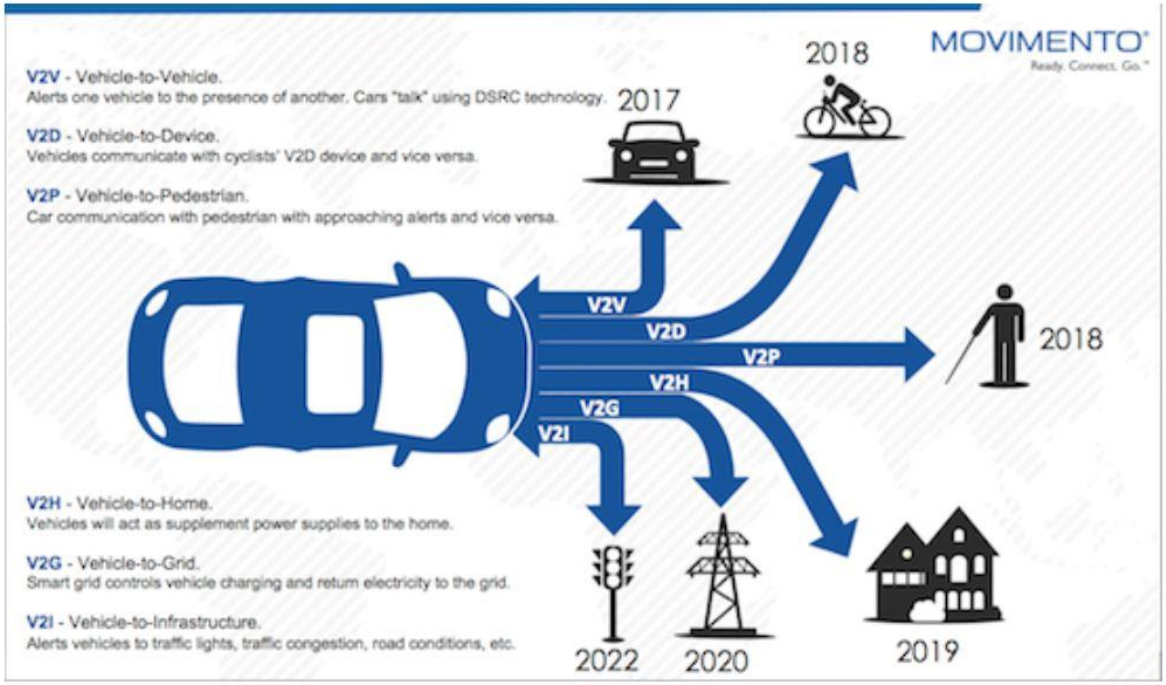
eMobility Infrastructure - Vehicle-to-Everything (V2X)



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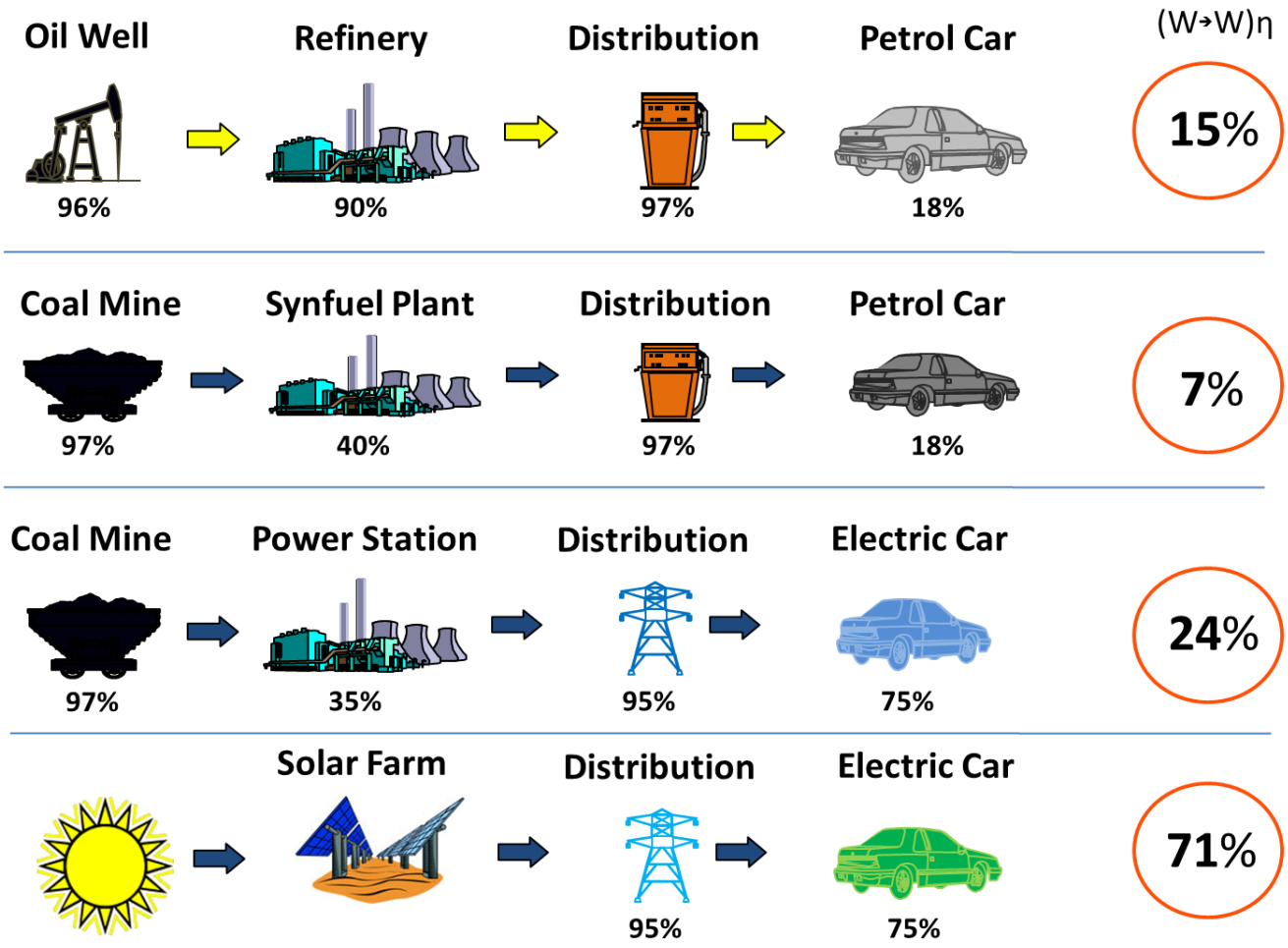
Energy Efficiency with Electric Vehicles



Source: SANEDI

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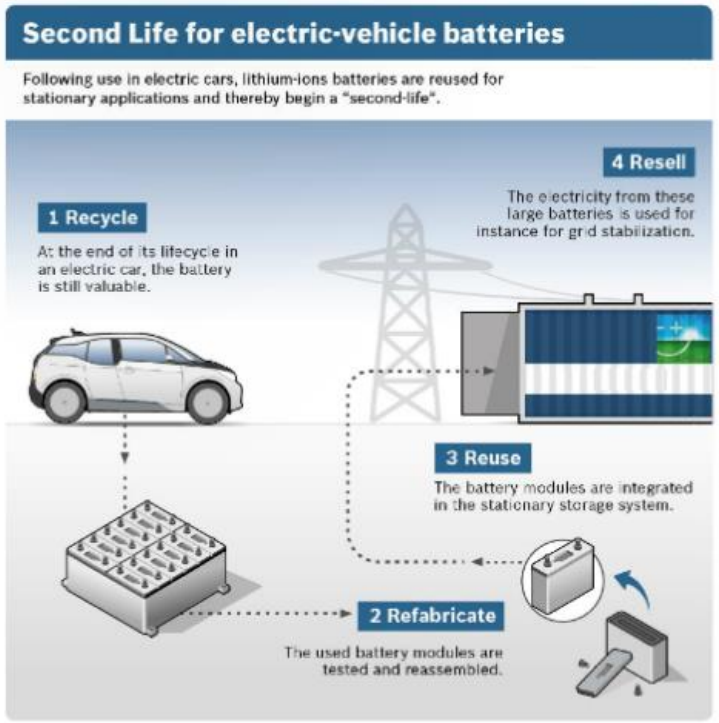
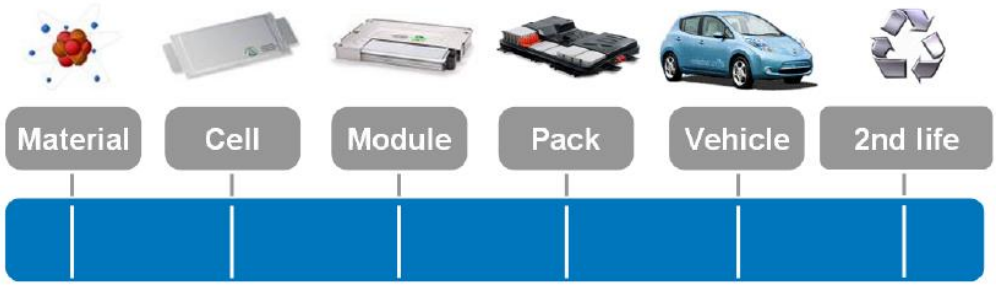
Electric Vehicle Battery Solutions

- **Reuse**
  Using EV battery packs for grid storage application
- **Refabricate**
  Involves dismantling the EV battery packs, assessing each cell, then remanufacturing a reconditioned battery pack
- **Recycling**
  Actual recycling of cell chemistry



Source: Charged EV



Source: Nissan

uYilo e-Mobility Technology Innovation Programme

- ‘uYilo’ - Local Xhosa word meaning to ‘*create*’ - a new industry - Electric Mobility

- Established in March 2013 through national government initiative of representing a national multi-stakeholder programme across both public and private sector

- Mandate to enable, facilitate and actively mobilise eMobility through national integration, government lobbying (polices, regulations), thought leadership, eMobility community cohesion and impact, and stronger industry linkages both local and international

uYilo e-Mobility Programme Eco-System

Source: P3 Engineering (Pty) Ltd

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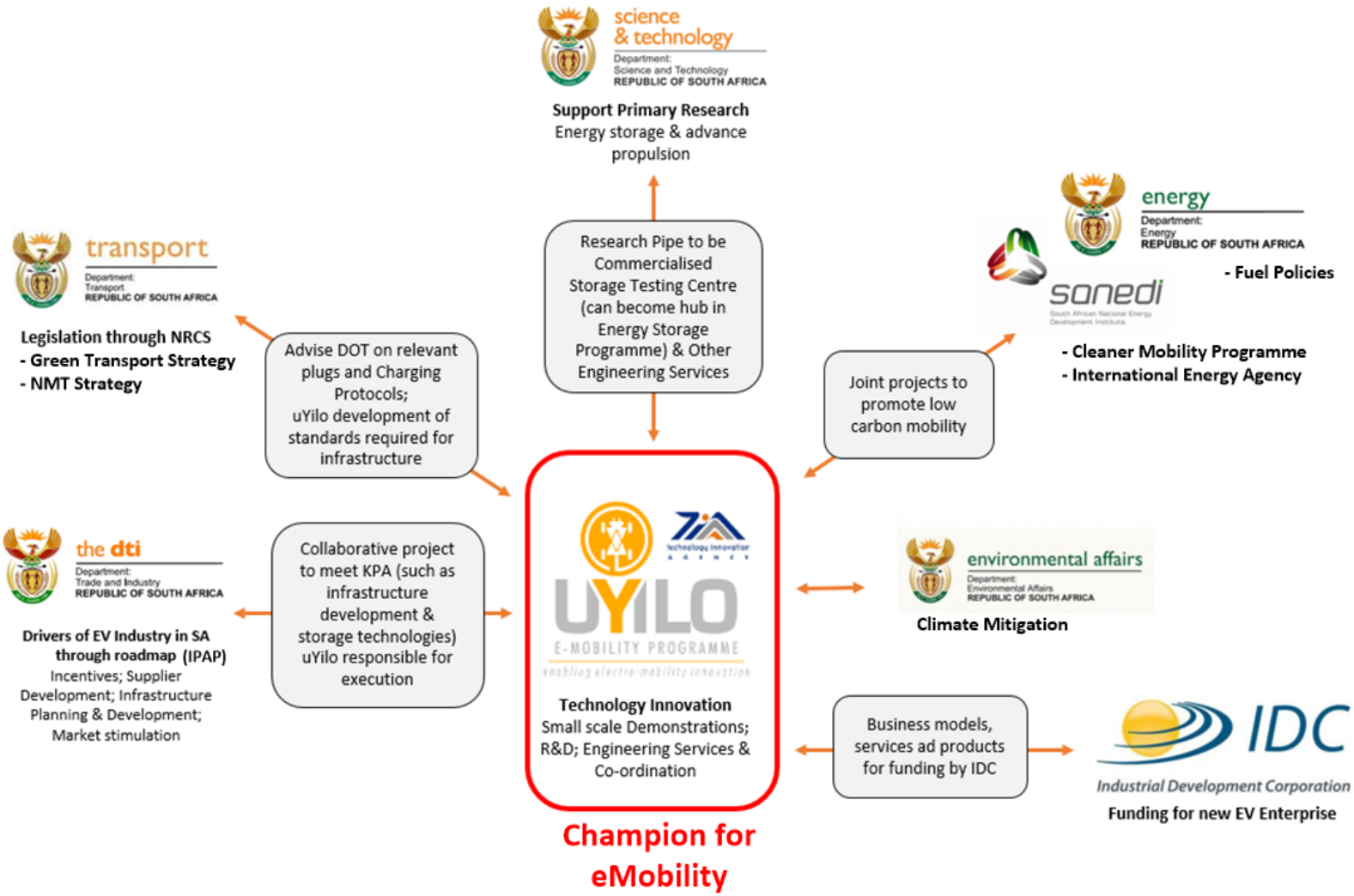
Multi-Departmental Approach



Electric Vehicle Industry Association

EVIA
ELECTRIC VEHICLE INDUSTRY ASSOCIATION

sanedi
South African National Energy Development Institute

Secretariat UYILO E-MOBILITY PROGRAMME enabling electro-mobility innovation

GridCars™

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BMW

To create a favorable environment to enable the use of clean mobility in South Africa.

To support the development of policy and regulatory framework.

To promote technologies for E-Mobility and sustainably integrate them into smart cities in South Africa.

To support the introduction of sustainable mobility into the urban transportation mix.

To create awareness of EVs in South Africa.

To promote co-operation and trust amongst public private sector.

the dti
Department: Trade and Industry
REPUBLIC OF SOUTH AFRICA

UNIDO

transport
Department: Transport
REPUBLIC OF SOUTH AFRICA

technology innovation AGENCY

environmental affairs
Department: Environmental Affairs
REPUBLIC OF SOUTH AFRICA

Joburg
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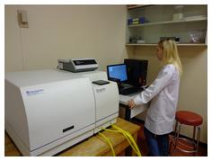
our future through science

CITY OF TSHWANE
IGNITING EXCELLENCE

www.evia.org.za

uYilo Facilities and Services

- *National Accredited Battery Testing Laboratory*

- *Electric Vehicle Systems Laboratory*


- *Live Testing Environment* - *Research, Testing, Development and Demonstration*



uYilo Kick Start Funding

Agile mechanism to fund applied research and development that will lead to creation of products and services

Foundation of Automotive Tier1/2 component suppliers towards local eMobility industry value chain

Aligned to APDP of the dti - component localisation incentive for future OEM's

Localization towards SA's development of eMobility EcoSystem technologies

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GridCars™

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EWIZZ ELECTRIC VEHICLES

MICRO CARE SOLAR COMPONENTS

INTELLIGENT MACHINES

Ubun2Tech

iet Solar Electricity

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uYilo Pilot Projects

Field Testing Programme - OEMs


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TRACKER
BMW i.

Off-road electric vehicles


SHAMWARI CMSV:XP CONSERVATION EXPERIENCE
sonedi
IMPERIAL GREEN MOBILITY
TRACKER
AUTOX

Micro electric vehicles uses



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IMPERIAL GREEN MOBILITY

Electric Bike sharing pilot


merSETA MANUFACTURING, ENGINEERING AND RELATED SERVICES SETA
NELSON MANDELA UNIVERSITY
MICRO CARE SOLAR COMPONENTS
eNtsa innovation through engineering

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uYilo Smart-Grid Pilot Project

- Solar energy **Generation** (12kWp)
- **Distribution** through multiple charger network (AC charge points, DC fast charger, V2G)
- Energy **Management** System (IEC 61850 implementation)
  - ***Supply*** side management - Sourcing from grid, solar, storage
  - ***Demand*** side management - ***Dynamic***, ***individual*** charge point load levelling
  - ***Time-of-use*** for optimised charging profiling during peak times
  - ***Phase Balancing*** - Reduced load onto local micro grid network

South African landscape of eMobility

eVehicles Sales:

National Sales (2013 - April 2017)

Hybrid	2,500
EV (Nissan and BMW)	355

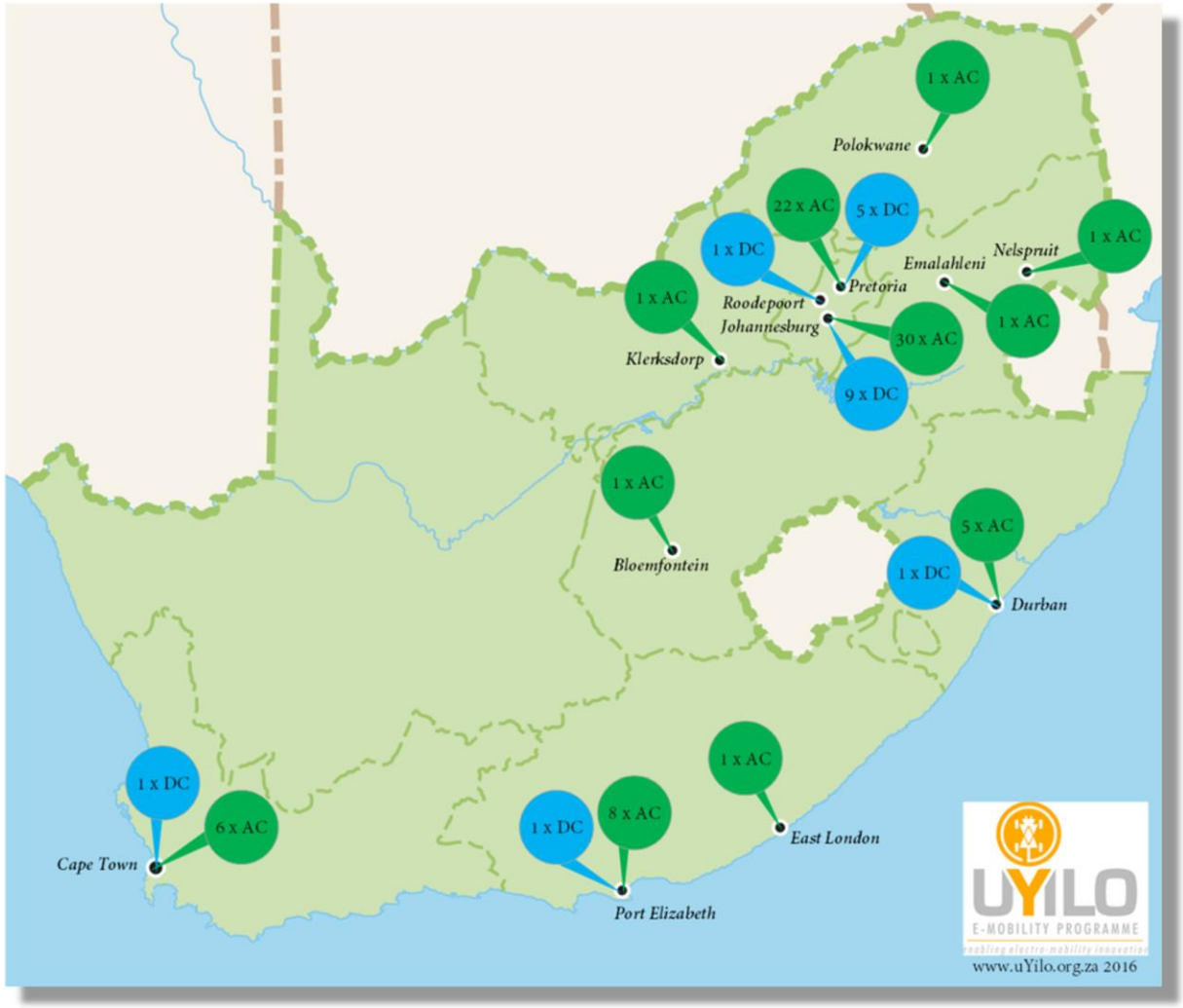
New market entrants:

Jaguar, Audi, Volvo

Infrastructure deployment:

95 public charging stations (Oct 2016)

- 12 national cities
- 77 standard chargers (green)
- 18 fast chargers (blue)



African Mobility Start-ups

Source: Frost & Sullivan

Africa's opportunity for electric mobility industrialization

- Southern Hemisphere regions are well endowed with some of the minerals for eMobility technologies
  - Democratic Republic of Congo has large reserves of Cobalt supplying global markets
  - South Africa has the second-largest reserves of manganese in the world
  - Zambia has largest reserves of copper in Africa
  - Zimbabwe has the fifth-largest lithium reserves in the world

- Global participation exists through strategic mining, processing and beneficiation of these minerals

- Opportunities exist to participate actively in the global value chain as one of the key suppliers

Africa's opportunity for electric mobility industrialization

- Lithium-ion battery manufacturing
- Niche mobility markets in Africa:
  - Micro-mobility vehicles
  - Utility vehicles
  - Agriculture mobility applications
  - Mining mobility applications
  - Tourism mobility applications
- Skills Development (High Voltage for Hybrid and Electric Vehicles)

  - ❖ Reduced air pollution
  - ❖ Reduced greenhouse gas emissions
  - ❖ Reduced fuel costs
  - ❖ Creation of jobs – Local assembly/manufacturing
  - ❖ Creation of new off grid opportunities in rural areas

Botswana - Chobe Game Lodge

Over the course of four years Chobe Game Lodge have converted 5 vehicles and 4 boats from conventional diesel and petrol burners to Electric drive

Electric Vehicles have covered a combined total of 125,040 km's, saving 22,329L of diesel and just over 58,725 Kg of CO2 emissions @ 5.6 km per L diesel.

Electric boats (EB's) have done over 7,818 hours, saving 3,636 L petrol @ 2.15 L an hour, giving another 8,435 Kg of CO2 emission saving.

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'Made in Uganda' Electric Car - Kiira Motors Corporation

KAYOOLA SOLAR BUS

KIIRA EV POC

KIIRA EV SMACK

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Thank You * Asante

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