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#EVs

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Introducing EVs to Southern Africa

An Opportunity for Deep Systemic Innovation

Towards a Green New Deal

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EVs as Catalysts for Deep Systemic Innovation in Southern Africa

Key Findings and Recommendations

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GLOBAL EV & E-MOBILITY TRENDS

WORLDWIDE GROWTH OF ELECTRIC MOBILITY

3% of the total
passenger cars



2017 **3 million** **68%** BEVs

2018 **5.1 million** **32%** PHEVs

2.8 million

to be sold this year



FINANCIAL

Global EV market to reach

\$567,300 million by **2025**,

growing at a CAGR of **22.3%** (2018-2025)

2018 EV GLOBAL STOCK



260 million
electric two-wheelers



460 000
electric buses

COMMERCIAL USE SALES



250 000 units
light-commercial vehicles



1 000-2 000
medium electric trucks



57.3%

y-o-y market growth

ENERGY CONSUMPTION

±58 terawatt-hours of electricity
(largely attributable to two-wheelers in China)



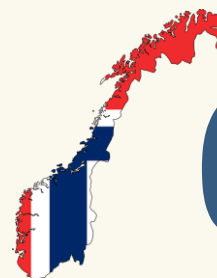
Emitted **41 million** tonnes of **carbon-dioxide equivalent (Mt CO₂-eq)**

Saved **36 Mt CO₂-eq** compared to equivalent ICE vehicles

32% of global energy = transport

China Leads

58% of global sales



60% Norway

KEEPING EVs GOING GLOBALLY

5.2 million
light-duty vehicle chargers

±10%
publicly
accessible

\$3.18 billion global EV charging
infrastructure market size





SADC countries

Namibia
Less than **10** EVs



Mauritius
Less than **500** EVs
9067 hybrid cars
(Sept 2018)

369 of 512 217

South Africa

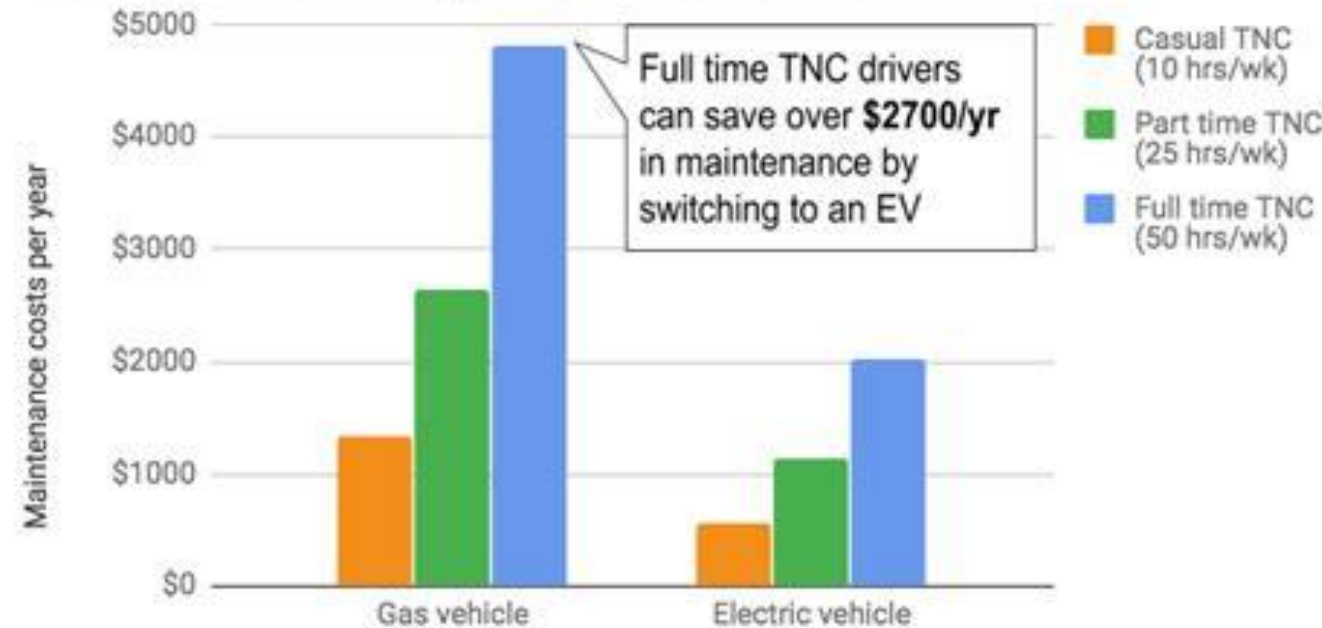
Less than **1000** (0.2%)



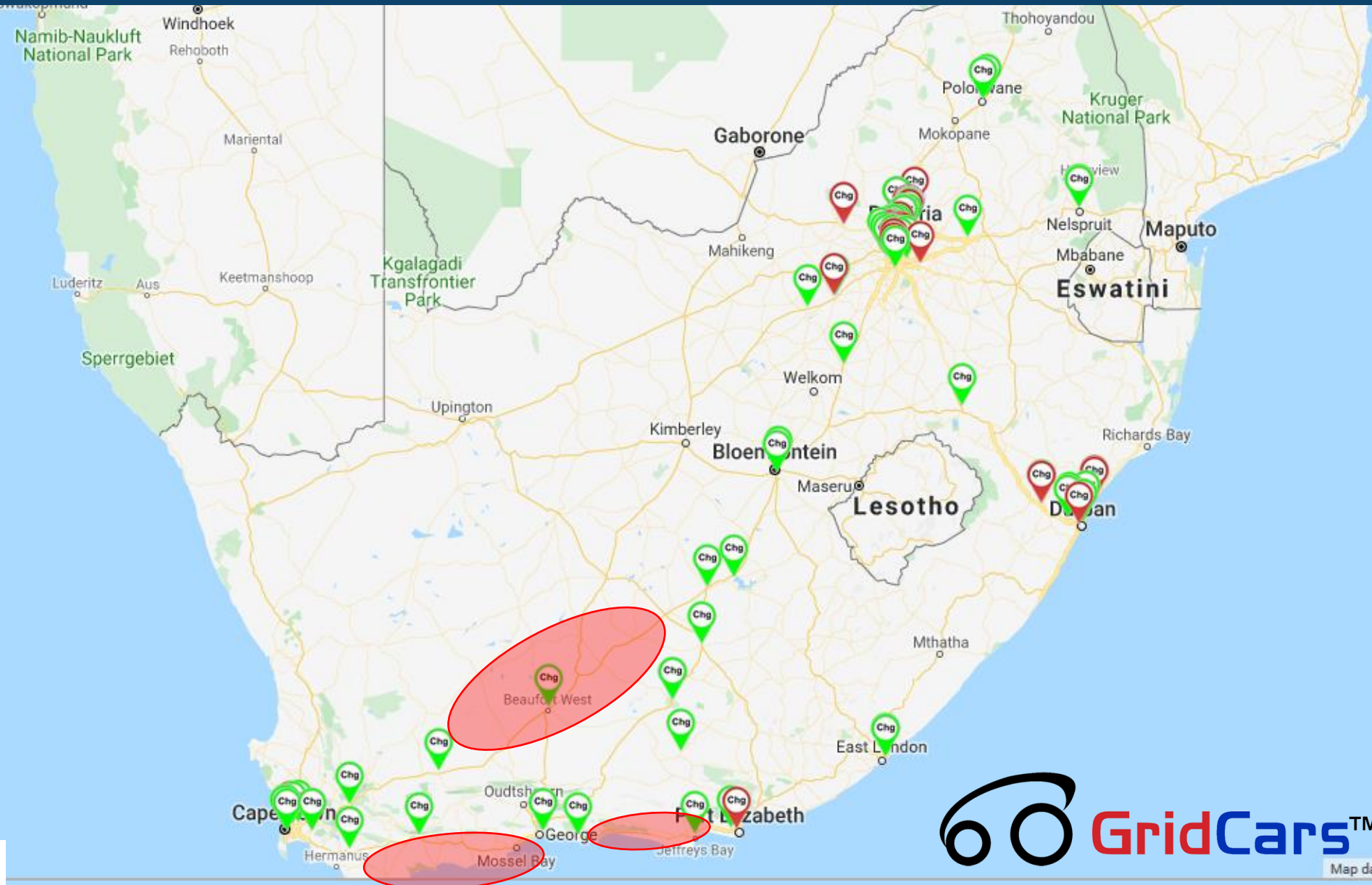
Essential Facts: The End of the Beginning

- Better driving experience & eco-friendly
- Cheaper to run, fun to drive, faster (urbanisation)
- Savings fuel and maintenance costs +/- R20k per year Mid-range EV
- Charging is easy and convenient
- Range is not a problem anymore (350-450kms)
- Easy to build, fewer parts to maintain / repair
- Battery prices dropped by nearly 70% in the last 18 months
- Significant drop in the prices of EVs by 2020 (2023)

Maintenance Savings with Electric Vehicles



South Africa's EV Charging Infrastructure



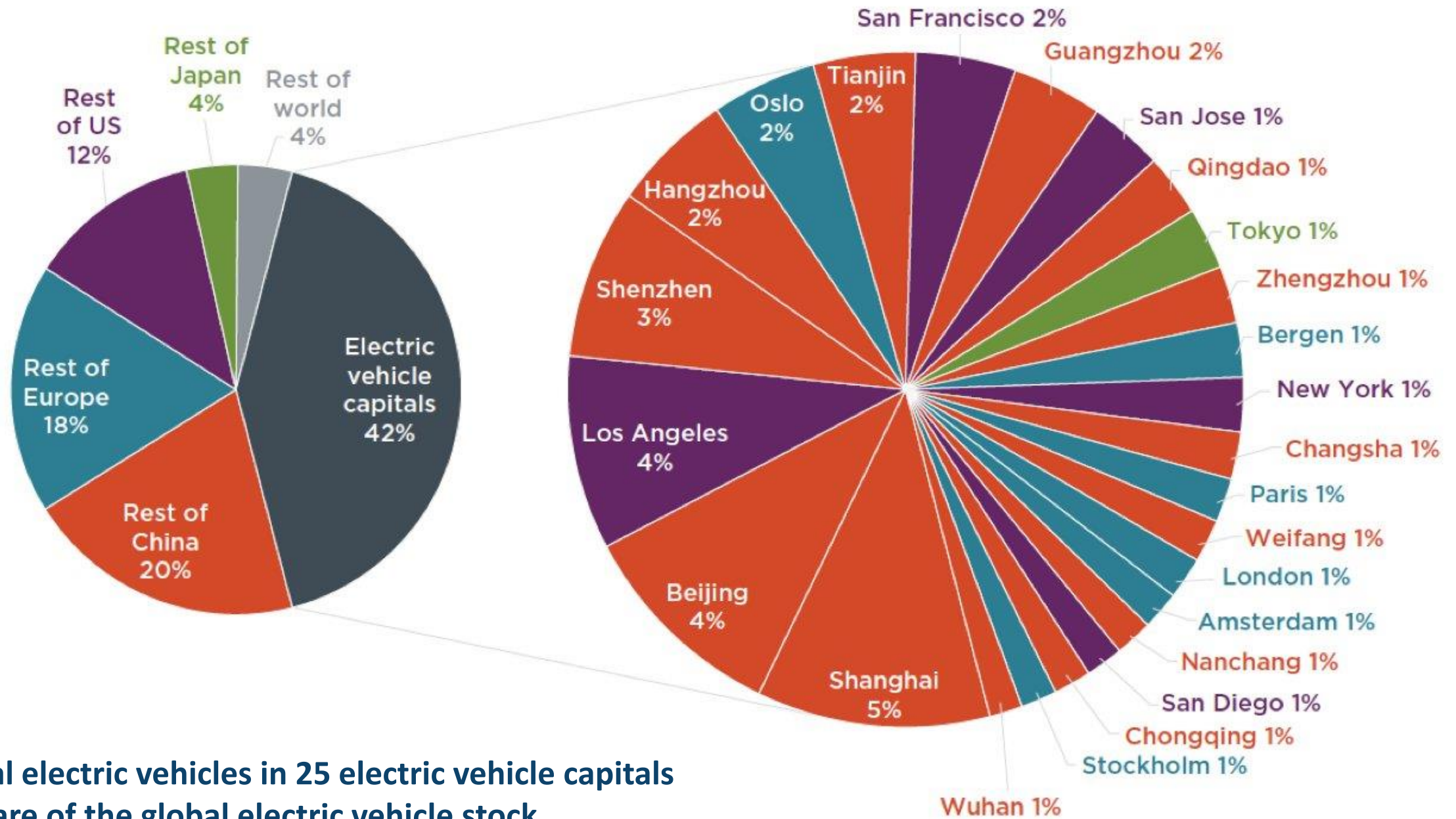
WHAT'S DRIVING E-MOBILITY?

Climate Emergency & ICE Bans (2025-2040)

- Pollution levels in the big cities
- Commitment to the Paris Agreement
- ICE (internal combustion engine) vehicle bans.
- Air pollution levels 2.5 times above the WHO safety standard (91%)
- South Africa: 14th largest emitter of GHGs despite the country's relatively small size overall representing 7.1% of GHGs globally.

Country	Ban announced	Ban commences
 China	2017	no date set ^[8]
 Costa Rica	2019	2050 ^{[9][10]}
 Denmark	2019	2030 ^[11]
 France	2017	2040 ^[12]
 Iceland	2018	2030 ^[13]
 Ireland	2018	2030 ^[14]
 Israel	2018	2030 ^[15]
 Netherlands	2017	2030 ^[16]
 Norway	2017	2025 ^[17]
 Sri Lanka	2017	2040 ^[18]
 Sweden	2018	2030 ^[19]
 United Kingdom	2017	2040 – England, Wales, Northern Ireland 2032 – Scotland ^[21]

Cities & mayors are taking the lead



Global electric vehicles in 25 electric vehicle capitals
as share of the global electric vehicle stock

Decreasing dependence on oil & gas

- Save in foreign exchange \$\$\$.
- EVs consumption is always local (energy imports minimised)
- China's push to become global e-mobility leader
- Use of RE has grown by 45% between 2000-2017.
- Enhanced battery storage capabilities



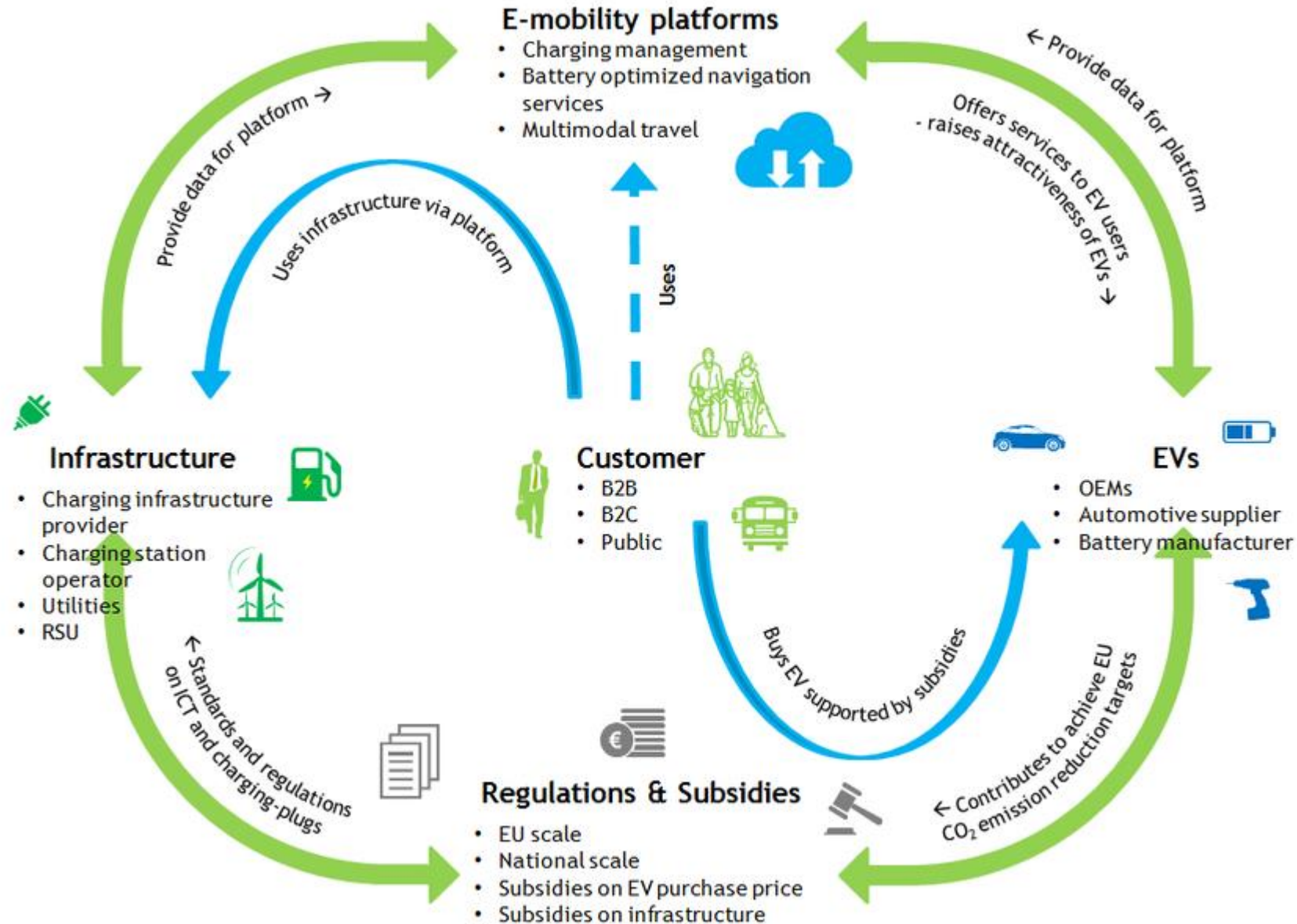
Energy Transition & Battery Mining: Prices

- Calls to switch to lowest cost option for energy generation is vital for growth
- OEMs launching plurality of models (city cars, SUVs, performance vehicles)
- Increase in range of incentives and subsidies offered by governments to automakers and car buyers
- SADC yet to adopt incentives or subsidies



**E-Mobility is changing how we
interact with vehicles
use energy
extract resources**

The E-Mobility Ecosystem



E-Mobility & 4IR

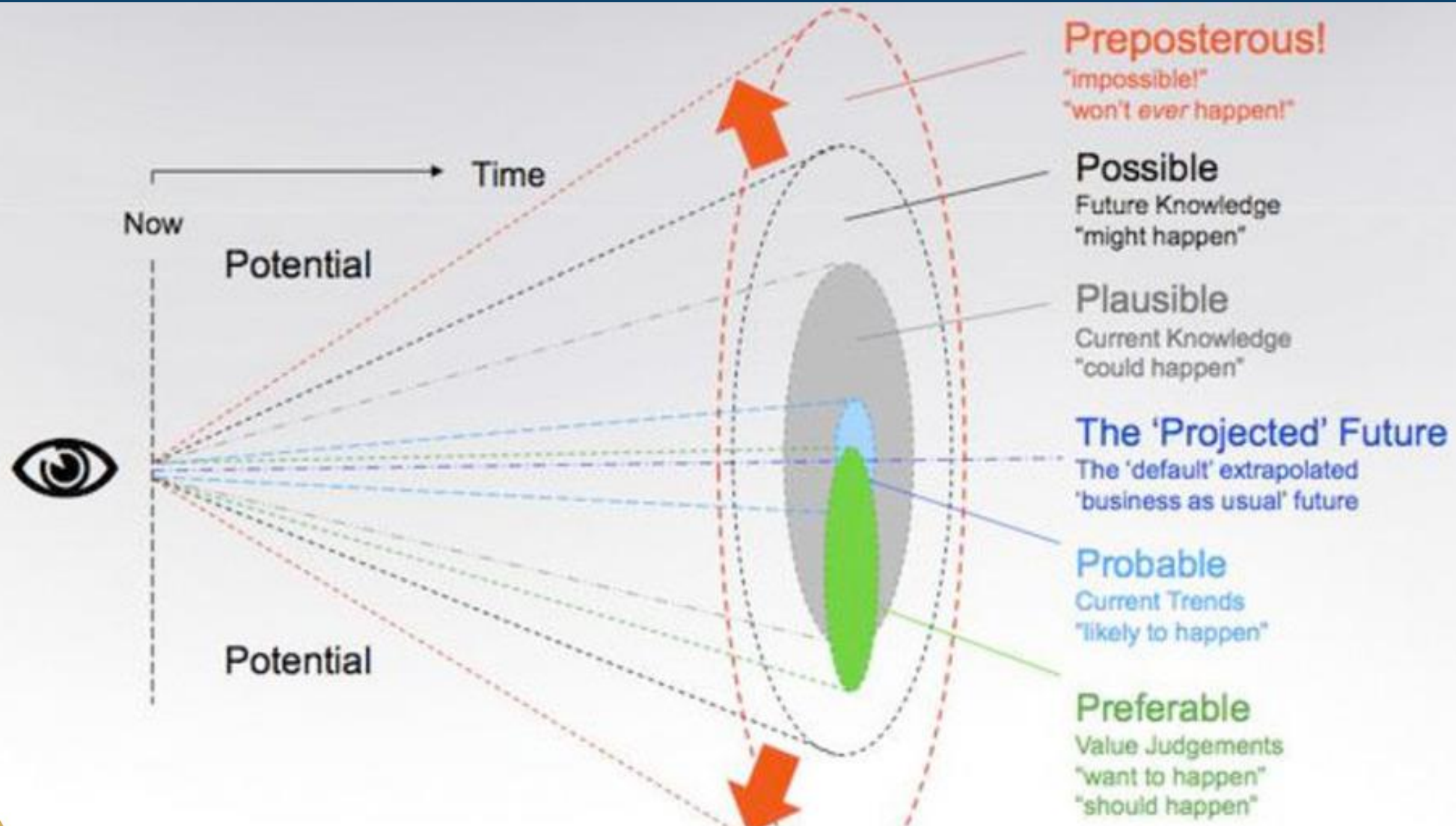
VUCA WORLD

Volatile, Uncertain, Complex, Ambiguous



USING E-MOBILITY AS AN OPPORTUNITY TO TRANSFORM SOUTHERN AFRICA?

Futures Literacy & Foresight: Using the Future



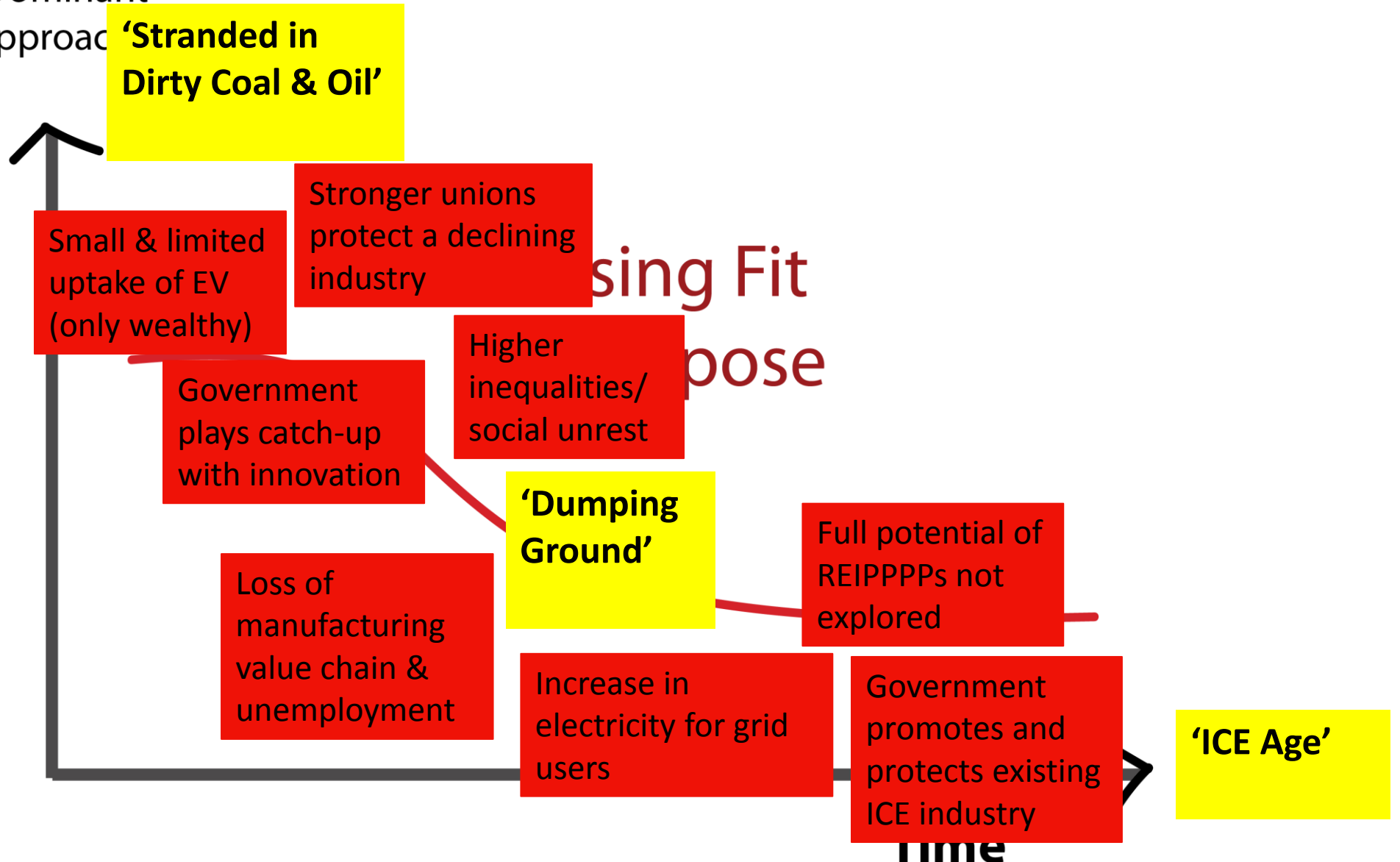
FINDINGS:

Systemic Innovations

Prevalence

(Dominant
Approach)

Horizon 1: Business As Usual

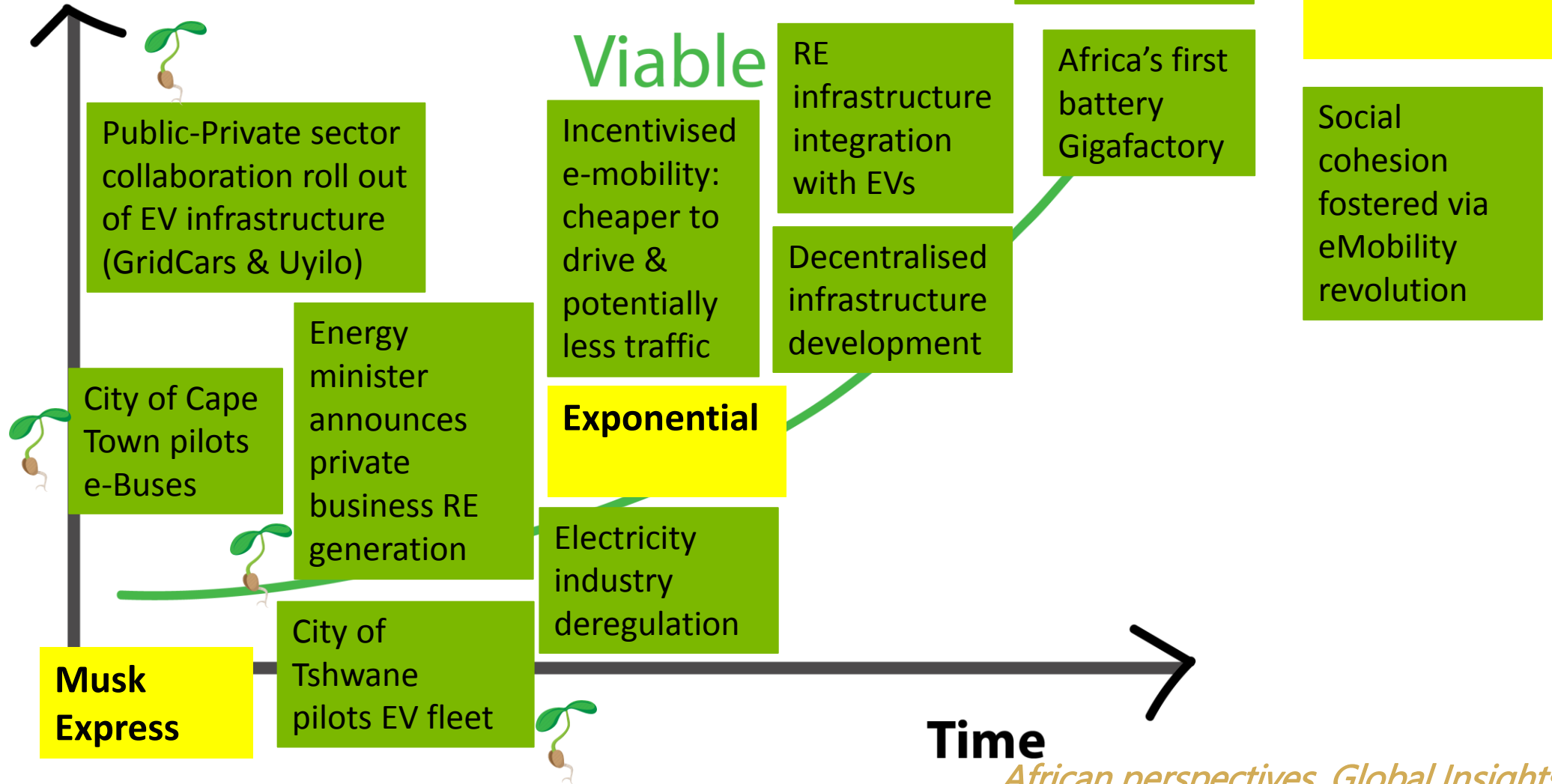


African perspectives. Global Insights

Prevalence
(Dominant
Approach/Mindset)

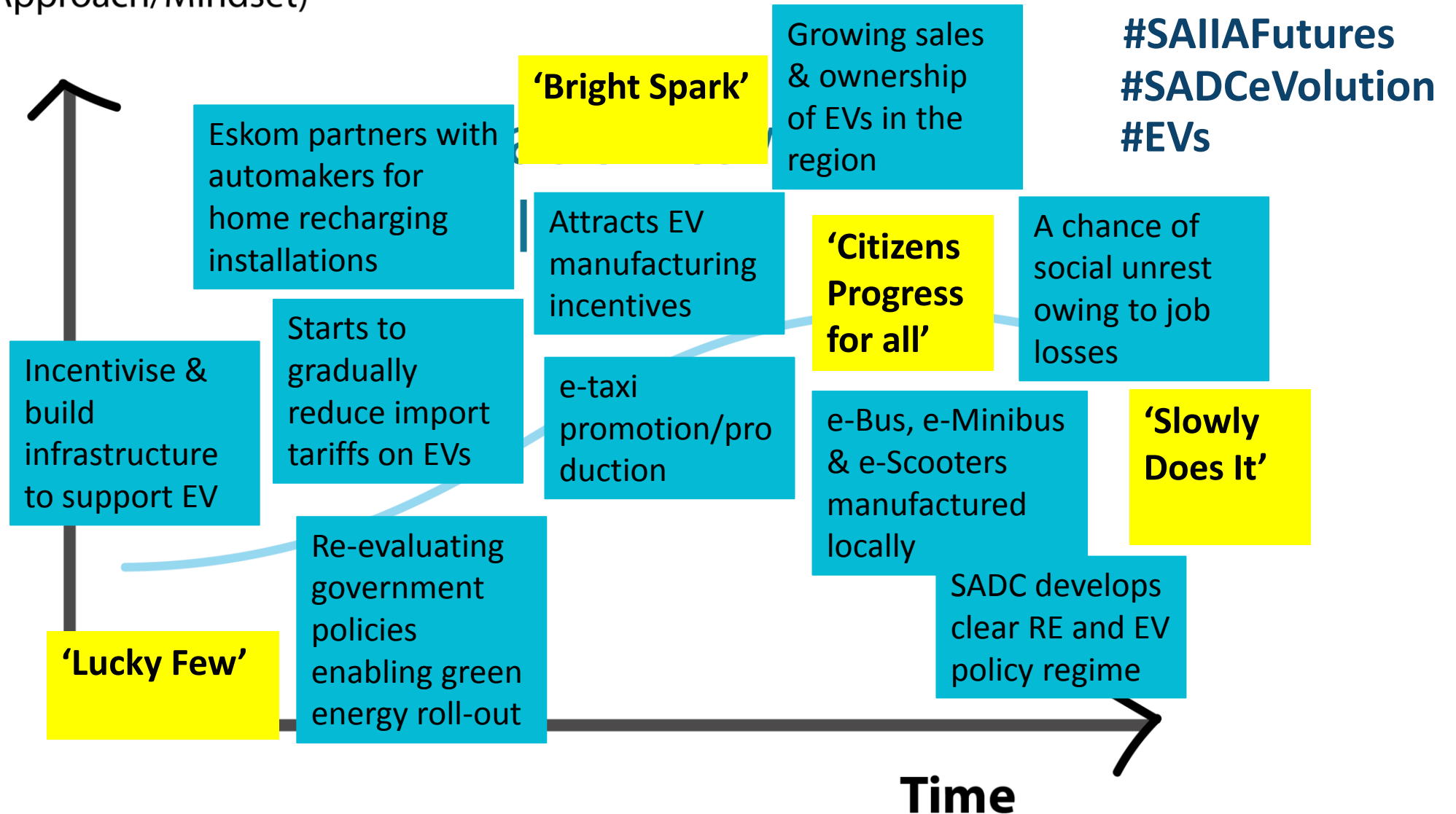
Horizon 3: Preferable

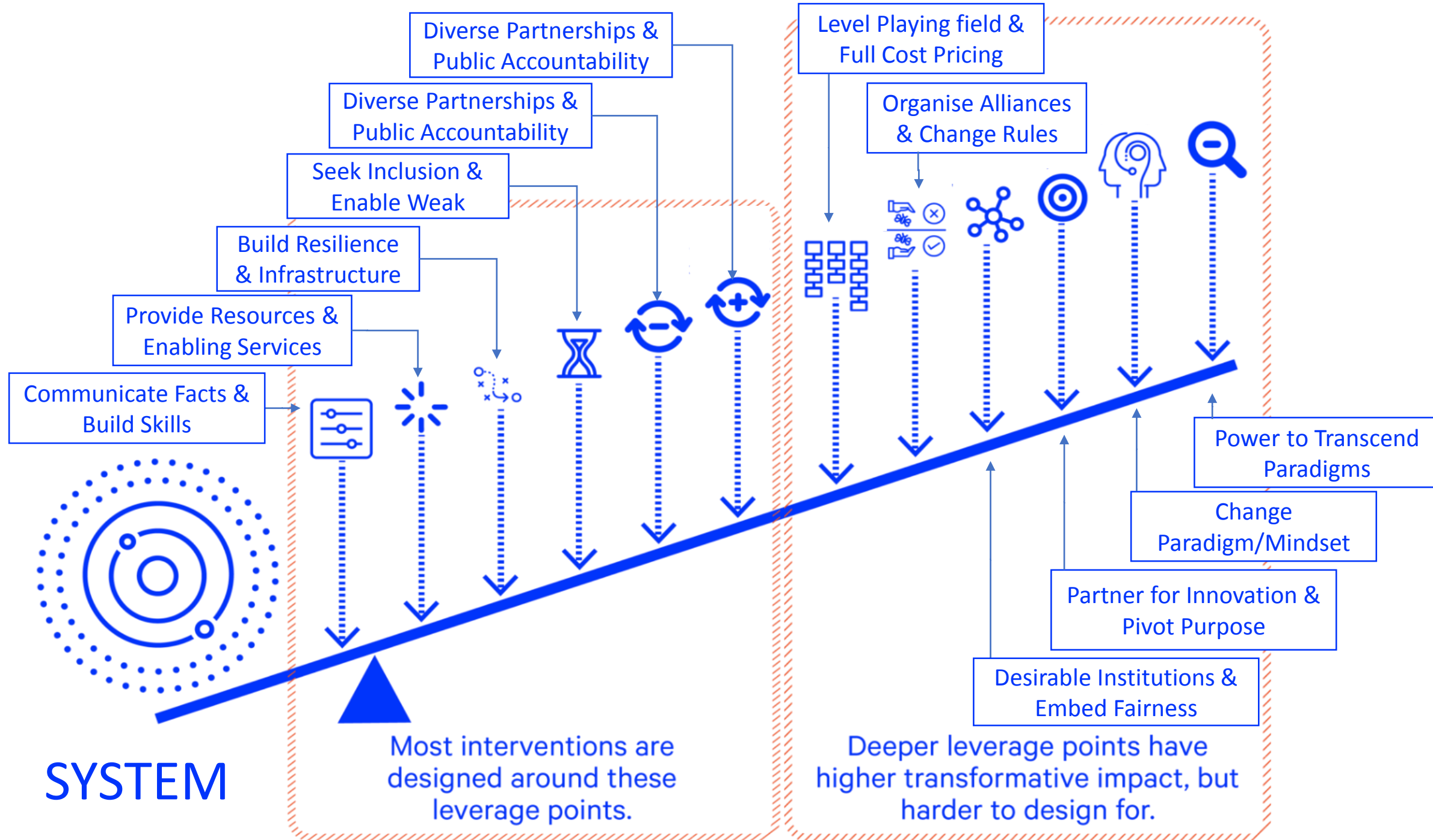
Vision of a
Viable



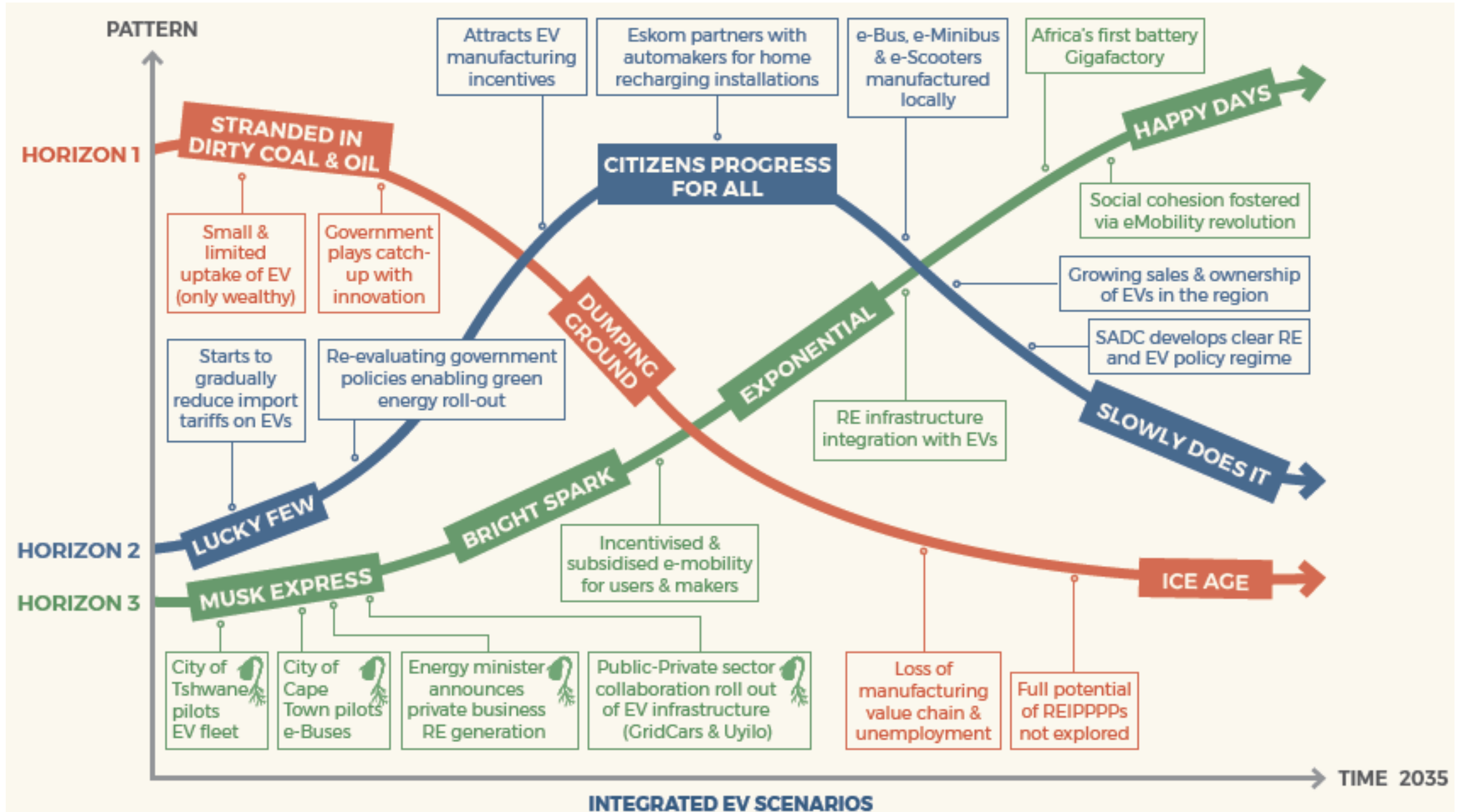
Prevalence
(Dominant
Approach/Mindset)

Horizon 2: Systems Innovations





Just e-volution: Low hanging fruit



IMPLICATIONS:

Towards a Just e-mobility transition

Climate Emergency & Decarbonisation

- Prioritise climate emergency
- Decarbonisation of the triple crunch industries
- Pursue a just electric mobility transition in Southern Africa

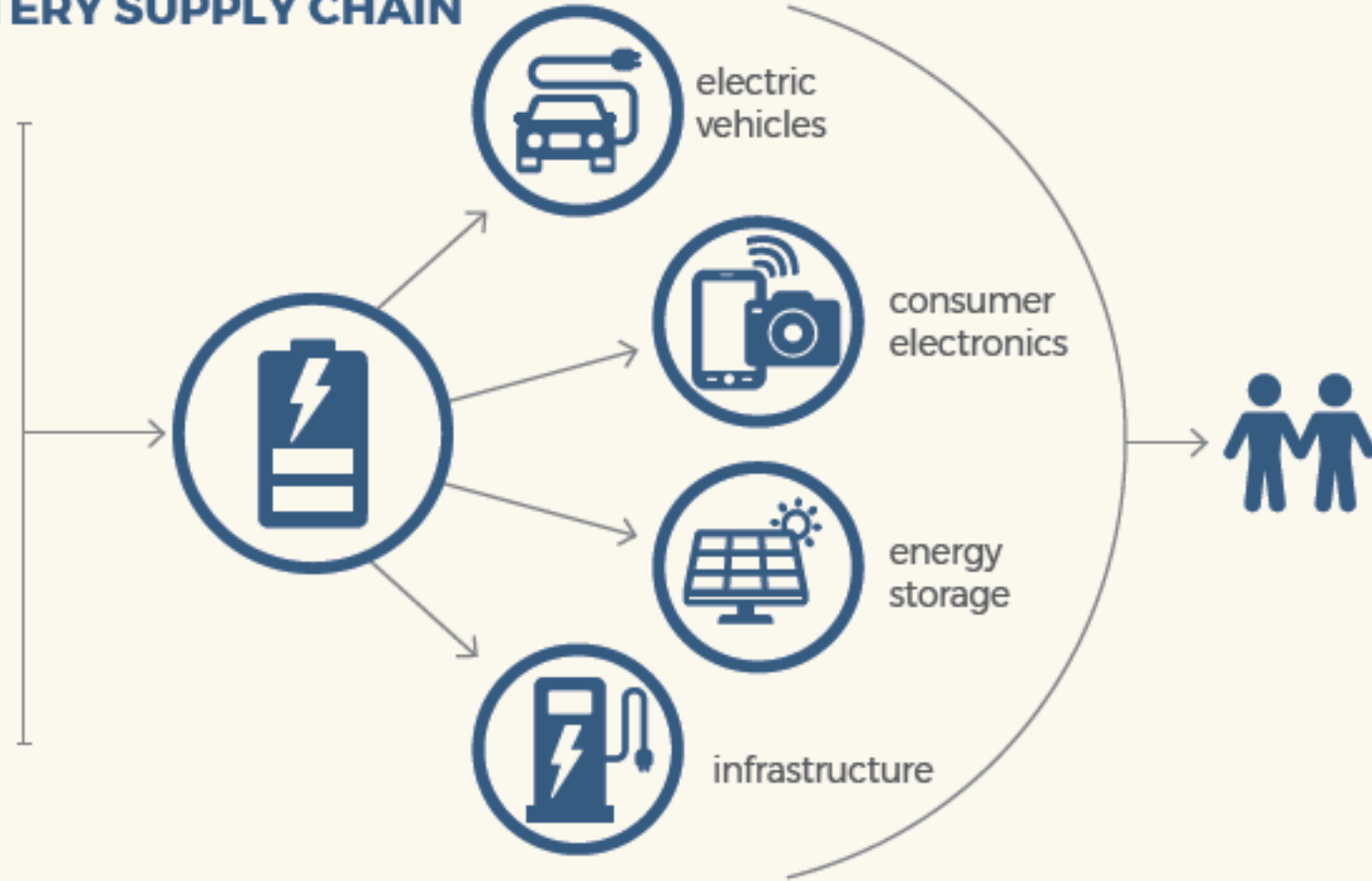


Develop Regional Battery Value Chains

- Regional beneficiation infrastructure
- Circular mining approach
- Sustainable mining ecosystems
- Blockchain-based mining
- Smart mining

POTENTIAL BATTERY SUPPLY CHAIN

Co cobalt
Cu copper
C graphite
Li lithium
Mn manganese
Ni nickel
V vanadium



Energy: Decentralisation & Microgrids

- Build decentralised energy grids and institutions that support fair e-mobility access.
- Eskom's pilot solar-powered microgrid at Wilhelmina Farm, Ficksburg, in the Free State.
- Smart Grid: Vehcile2Grid & Vehicle2Home



Electrification of fleets

- Pursue electrification of government fleets
- Incentivise and support electric taxi and bus networks through innovative financial subsidies (PAYS Greencape).
- LSEVs as critical intervention for rural mobility and gender equality

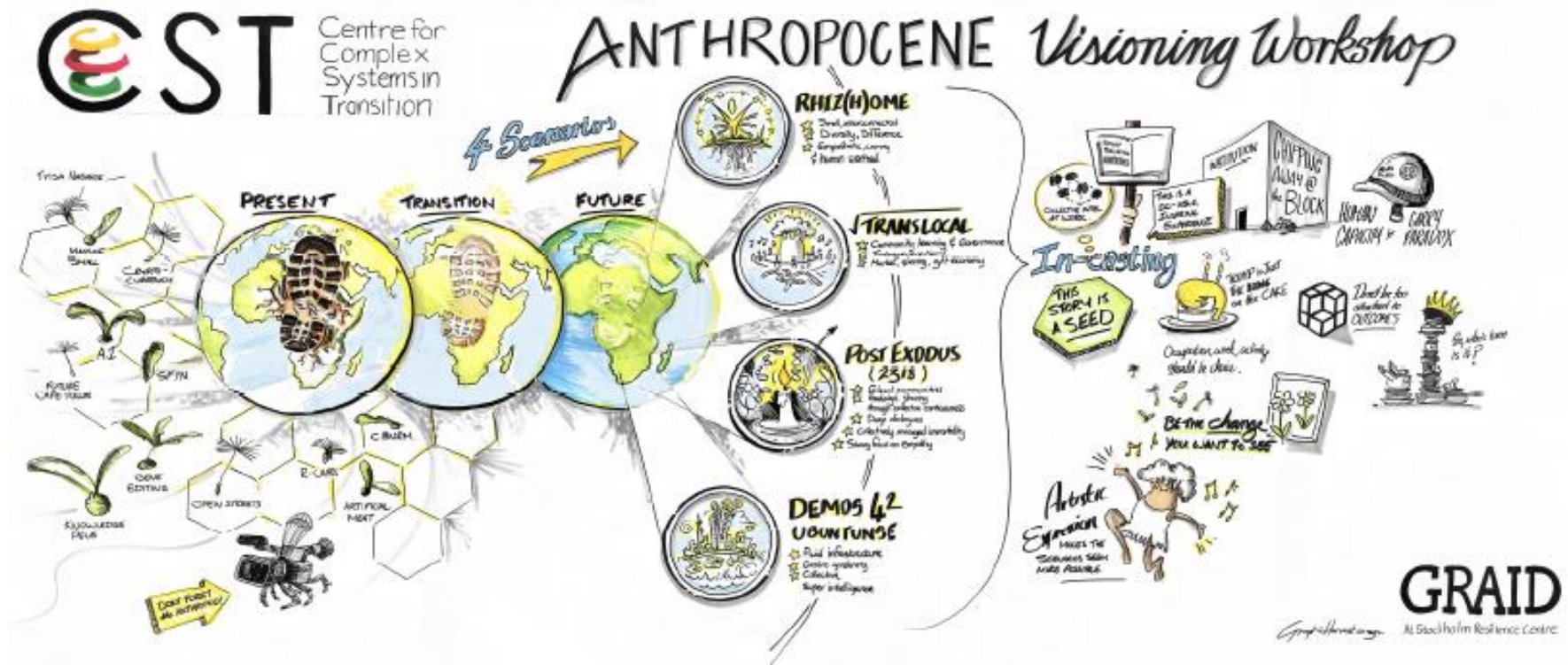


- The City of Cape Town piloted e-buses
- City of Tshwane small fleet of EVs



Visioning, Foresight & Anticipation

- Work with multiple strategic decision-makers and interest groups in SADC
- Establish a shared developmental vision harnessing the opportunities presented by the e-mobility transition.





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Thank you!



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