



Electric Mobility – Trends and Challenges

DAM Capital EV Conference 2021

Tata Power
New Business Services
17th March 2021

Lighting up Lives!

Tata Power – India’s largest integrated Power company...



~30% of generation
Clean energy sources

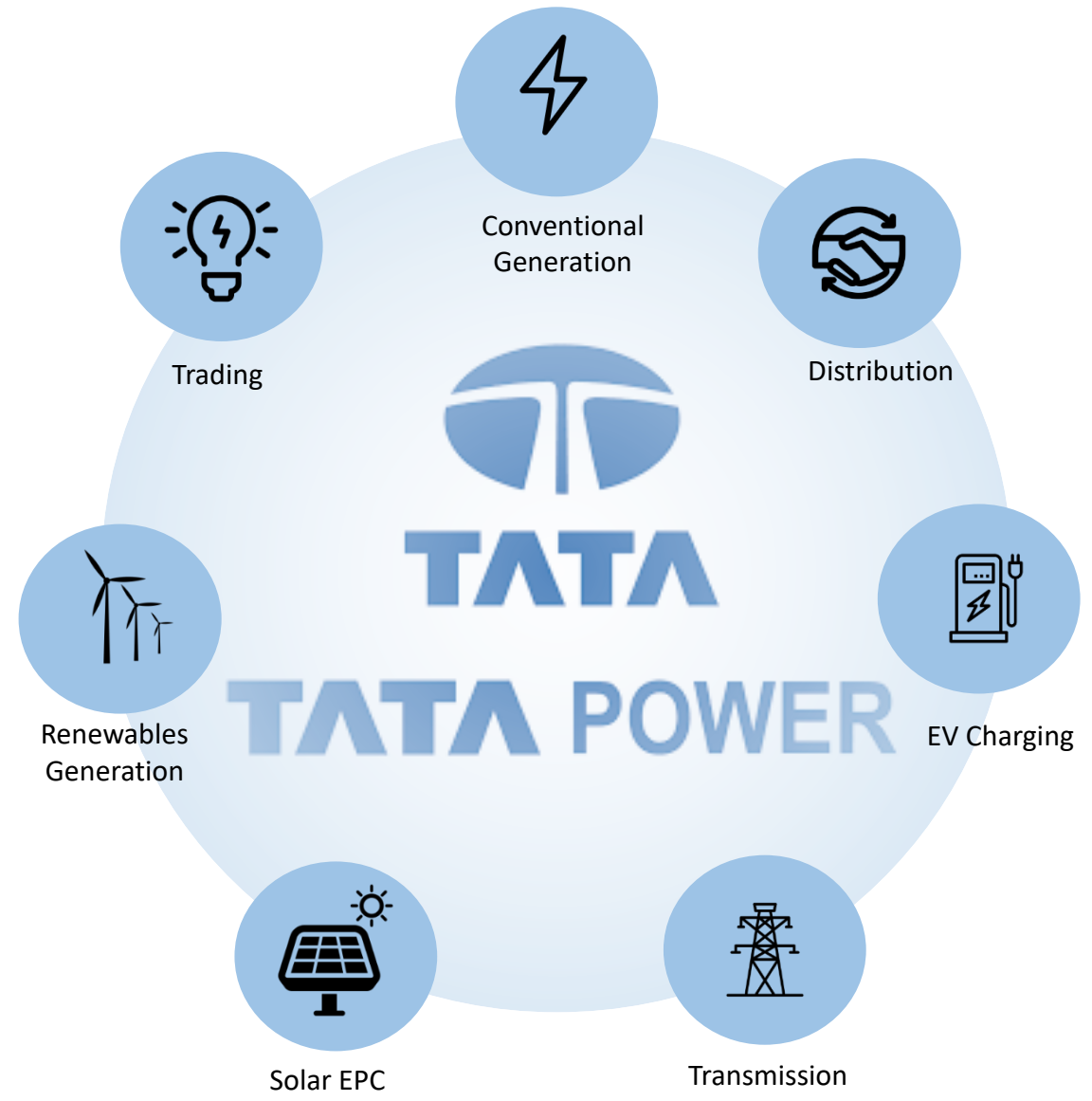
India’s #1 Solar
Rooftop EPC Player

Over **100** years of
legacy and tradition
of responsibly
delivering value...

Pioneered
Generation of
Electricity in India !!

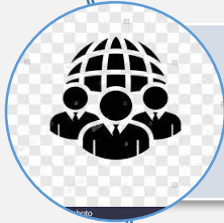
12 GW
Installed Generation
Capacity

12 Million
Customers across
India





Why Electric Mobility ?



Global Scenario in Evs, Indian Context



Enablers for Electric Mobility



Challenges to this ecosystem



#ElectricVehicles

#Future of mobility

#SustainableTransportation

- India is home of 7 of the top 10 polluted cities in the world.
- Heavy drain on foreign exchange
- Uncertainty of oil prices.
- Very high risk on the Geo-political front – Middle East
- EVs are inherently better vehicles.
- Government is focusing very strongly on EV ecosystem....



- Return of the demand... fueled by and helped by COVID
- EVs have successfully entered the national narrative.
- Globally its become virtually a movement.... New car launches every week.
- Most importantly We are seeing successes.



EVs Industry - the growth is inevitable !!

About 7.2 million Electric Cars were on road globally at the end of 2019, of which 6 million were added in just 4 years...



ELECTRIC CAR SALES GROWTH (2015-2019 AVG.)



55%
ANNUAL GROWTH

ASIA



32%
ANNUAL GROWTH

AMERICA



26%
ANNUAL GROWTH

EUROPE



41%
ANNUAL GROWTH

WORLD

Why EVs adoption is going up?



Decline in Battery Cost



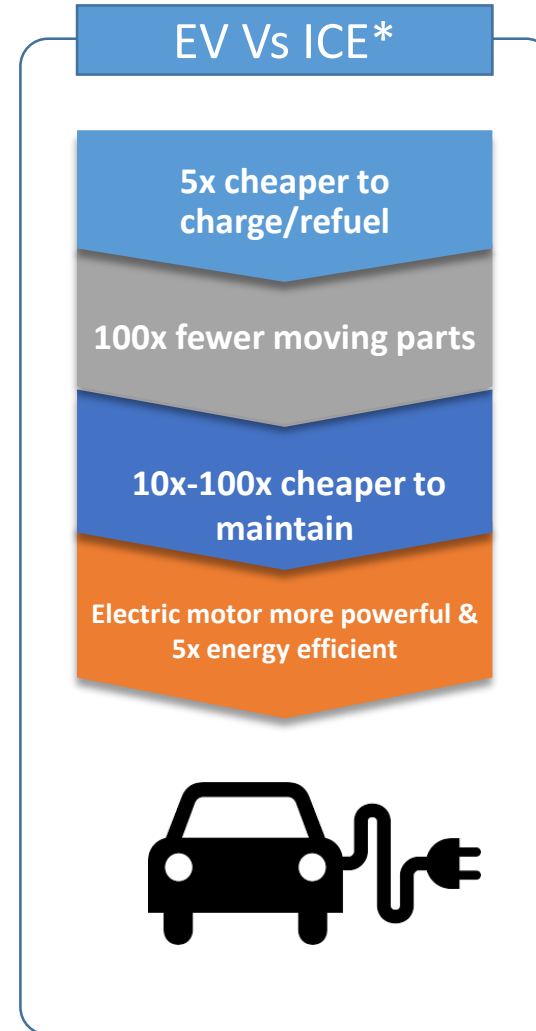
Stringent Environmental Norms



Government's Push



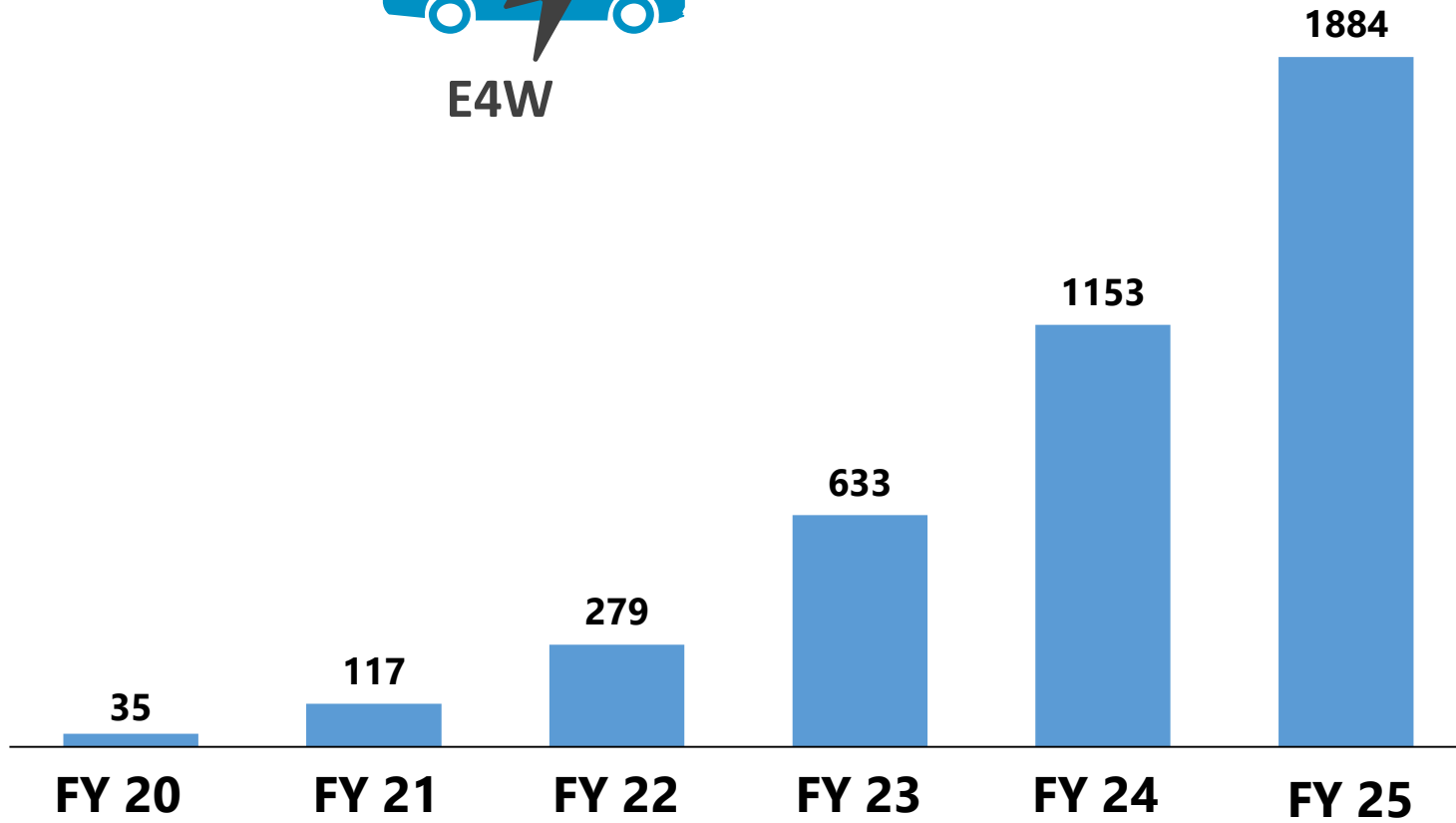
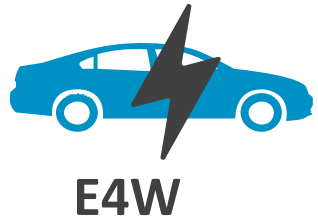
Technological Advancements



Advent of EVs is inevitable not just because of Government push but also because of its standalone commercial/economic benefits



EV Car Stock India² – Projections (‘000s)



Source: TSMG

Notes: 1) TCO = Total Cost of Ownership
2) Assumes 6,000 as current EV stock

EV 2Wheeler India – Projections



FY25 EV Sales Vol.

5000K – 6000K

EV Penetration

20 – 25%

Already commercial passenger e4wheelers; e3wheelers; e2wheelers are net TCO¹ positive and this coupled with Govt’s incentives is increasingly driving their demand !!

Upcoming EV Launches over next few months in India



Volvo XC40 Recharge



Jaguar I-Pace



Tata Altroz EV



Mahindra eKUV100



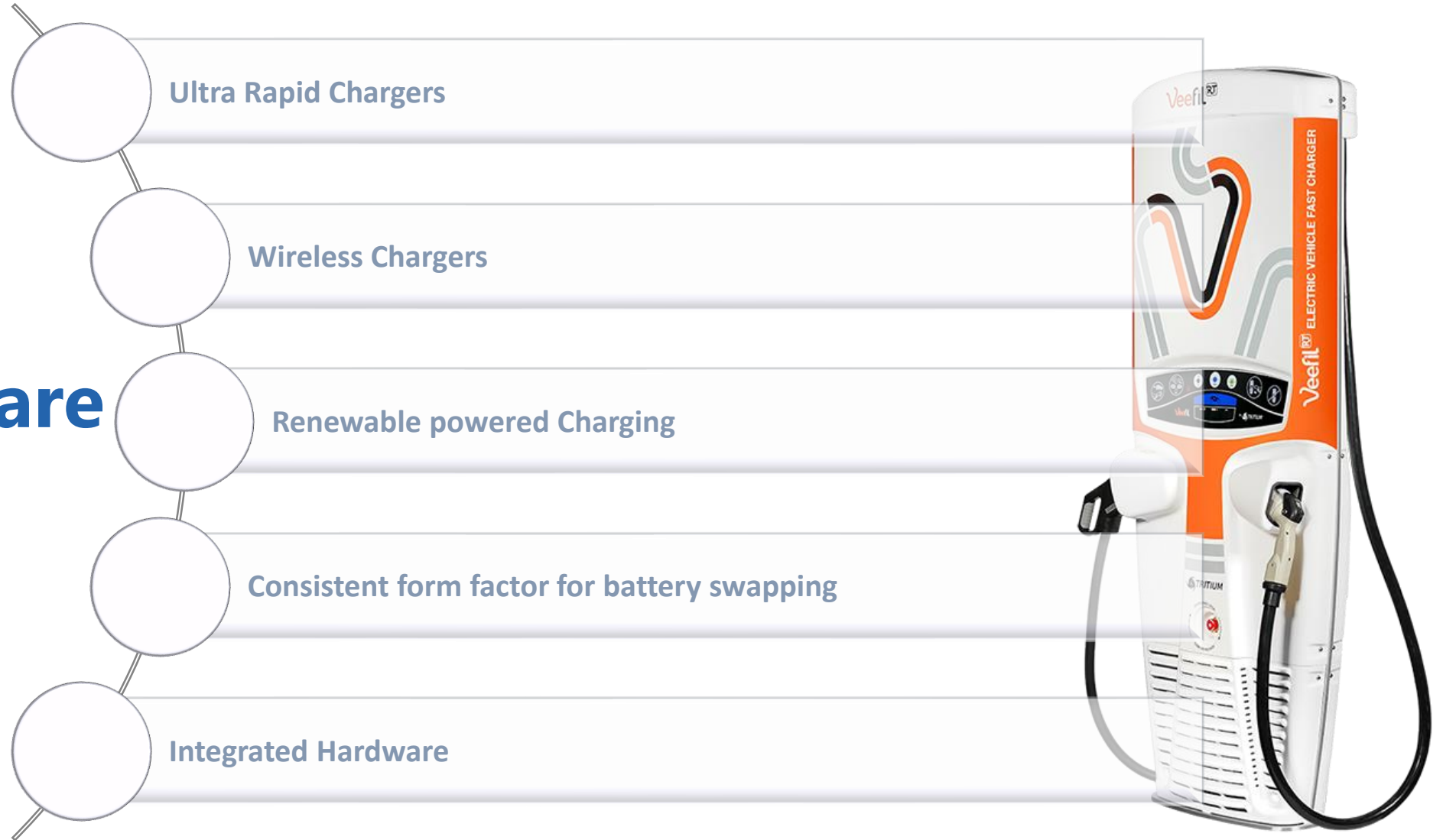
Audi e-tron



Tesla

Note – Prices and Specifications of above EVs may vary at the launch. Above numbers are estimates.

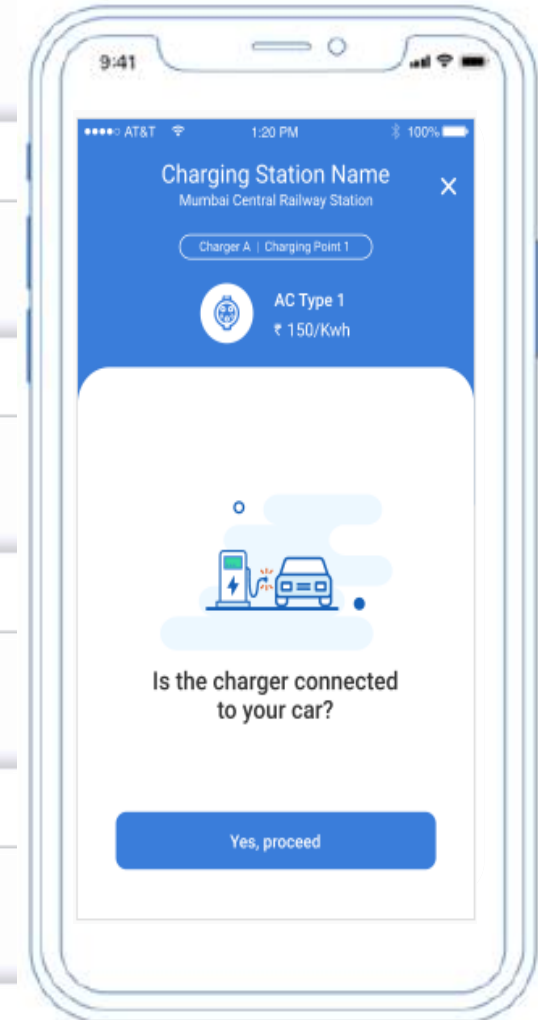
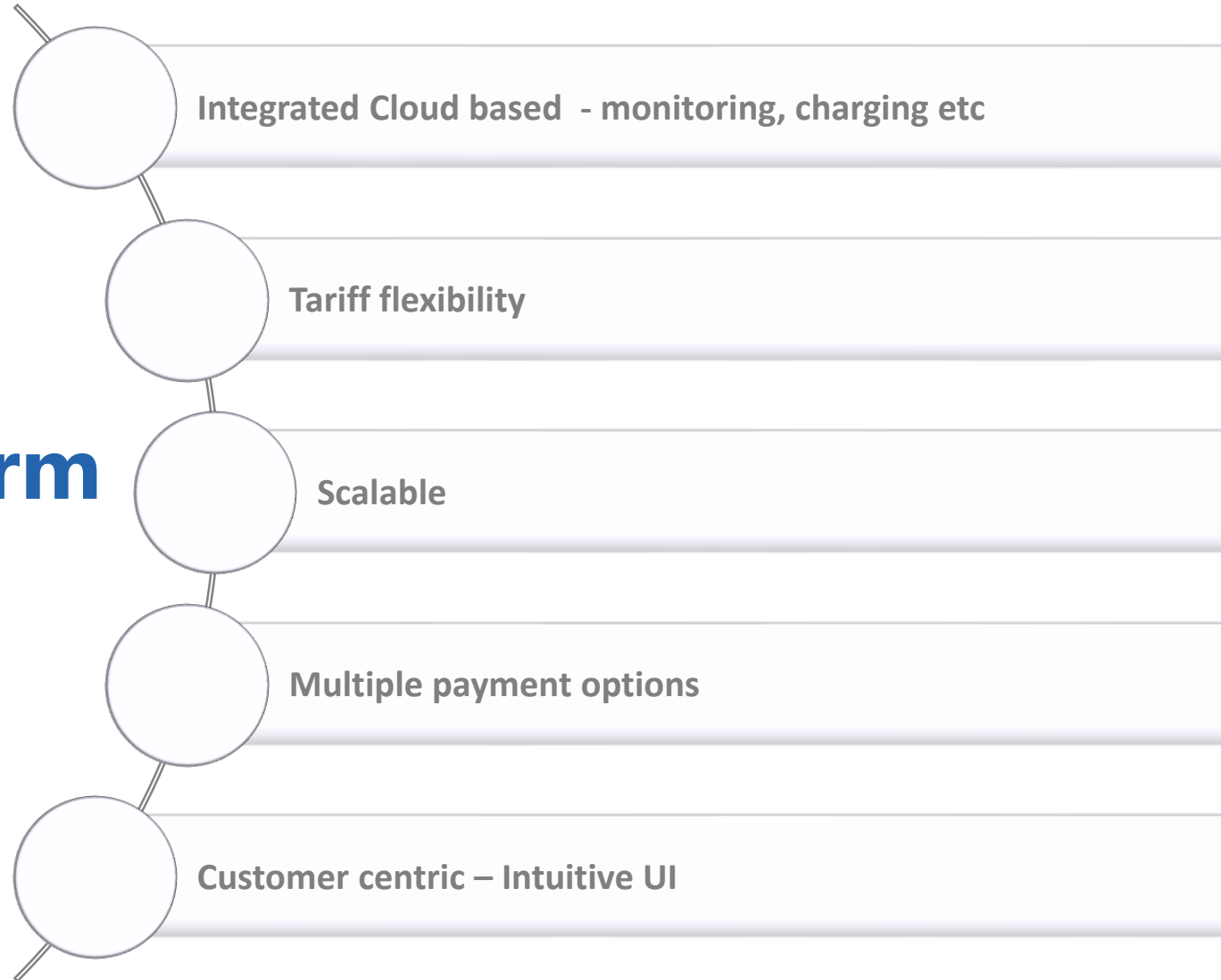
The Hardware



Centralized vs Distributed refueling



The Platform



World Class Platform



Power of a Robust Cutting Edge platform



RFID Management



User Management



Charger Management



Pricing Management



Wallet Management



Partner Management

Fleets



Corporate

Housing Societies & Homes

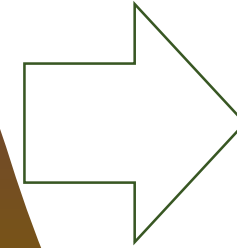


Malls & Retailers

Hotels



Franchisee Partners



And this is a continuous process....

Power of Domain Expertise

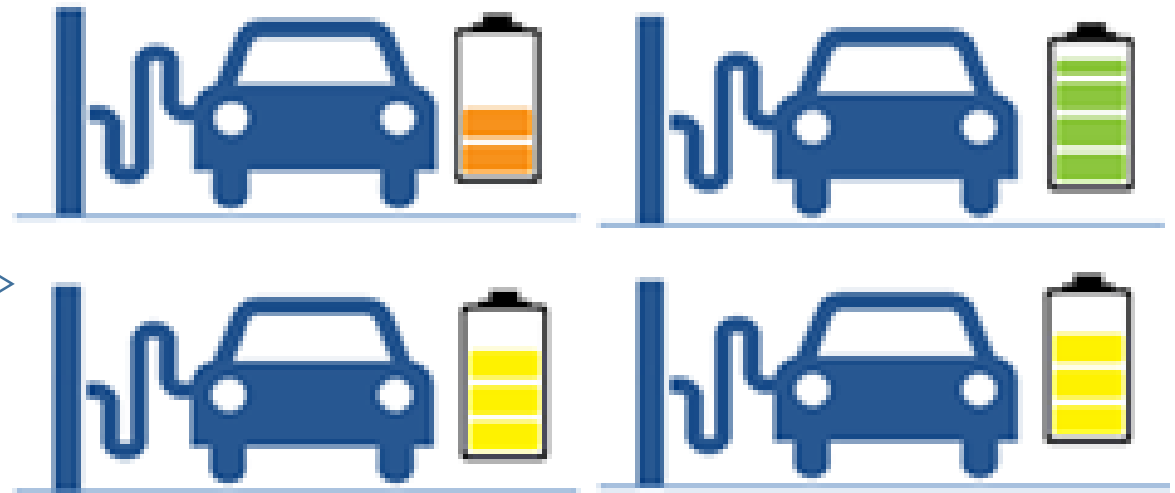


Supply Side

Demand Side

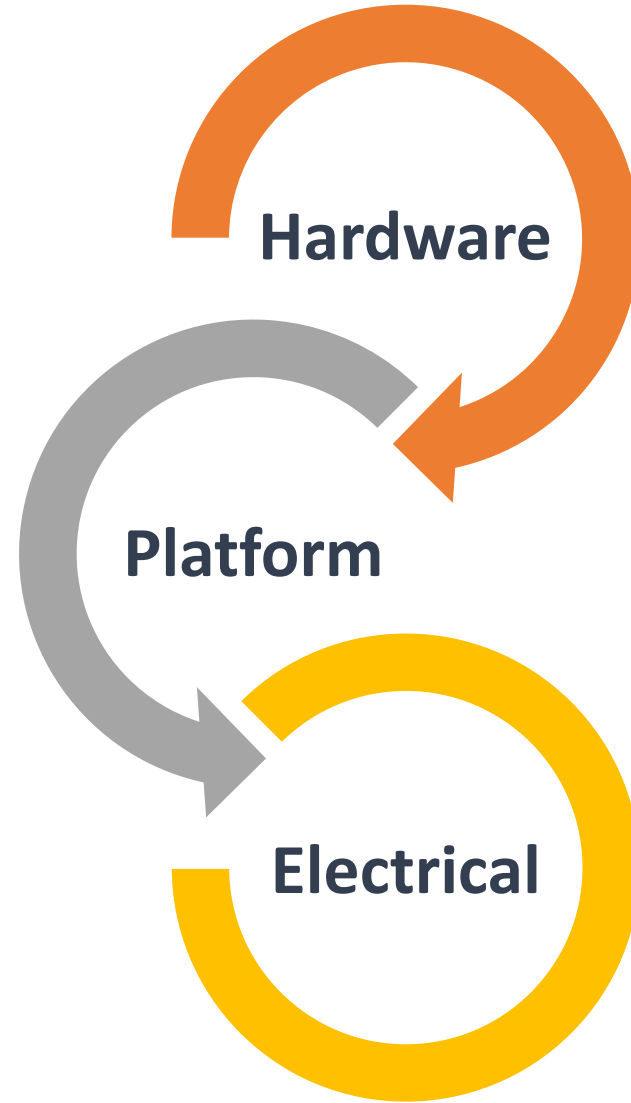


Grid Management





The Confluence





India can become electrical vehicle manufacturing hub in 5 years: Nitin Gadkari

1 min read . Updated: 19 Jun 2020, 08:28 AM IST

Electric Mobility Is India's Next Big Opportunity: Niti Aayog's Amitabh Kant

100% Confident: In Nitin Gadkari's Push for Electric Vehicle Adoption, a Promise of Crores of Jobs



Amitabh Kant ✓ @amitabhk87 · Jan 4

Big move: Giving a major impetus to Electric Vehicle mobility Govt has approved installation of 2600 EV charging stations in 62 cities under FAME -2. Atleast one charging station will be available in a grid of 4 KM *4 km. This would remove range anxiety.



Amitabh Kant ✓ @amitabhk87 · May 18, 2019

India to frame indigenous EV charging station norms



Policy Updates for Evs...



2013

2019

Phased Mfg. Plan released

NEMMP 2020



2019

FAME-II Policy



2015

2019

Import duty reduction for EV components

FAME-I Policy



2018

Modern Building Bye-Laws

EESL Tender for 10k EVs floated

2017

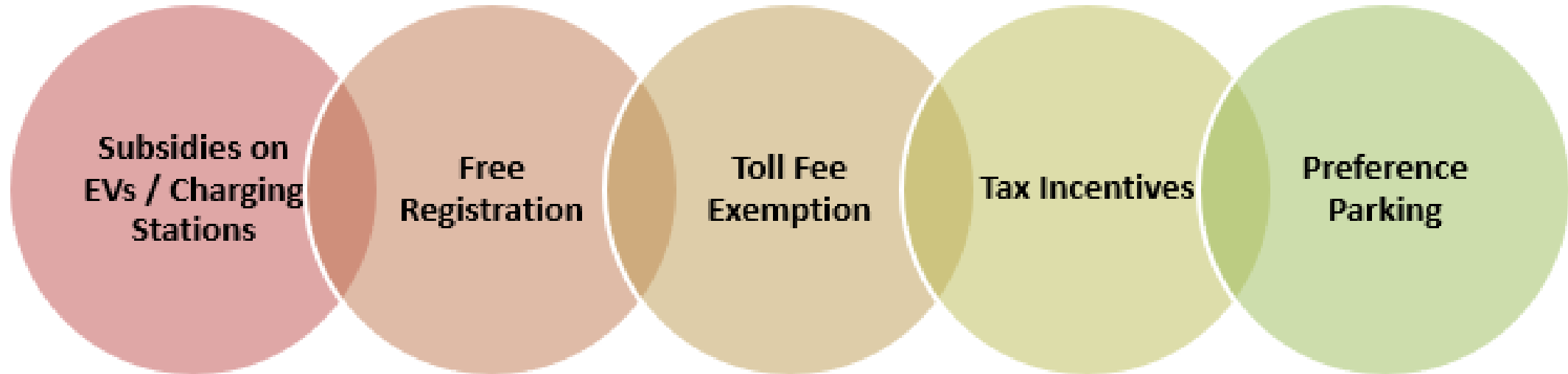


2018

Charging Infra Guidelines & Standards

Cities eBus tenders





Active Policy interventions and initiation of Pilot Projects by multiple State Govts. and City Municipal Bodies

Power of Pan India Presence



Mumbai



Delhi



Hyderabad



Bangalore



Pune



Ahmedabad



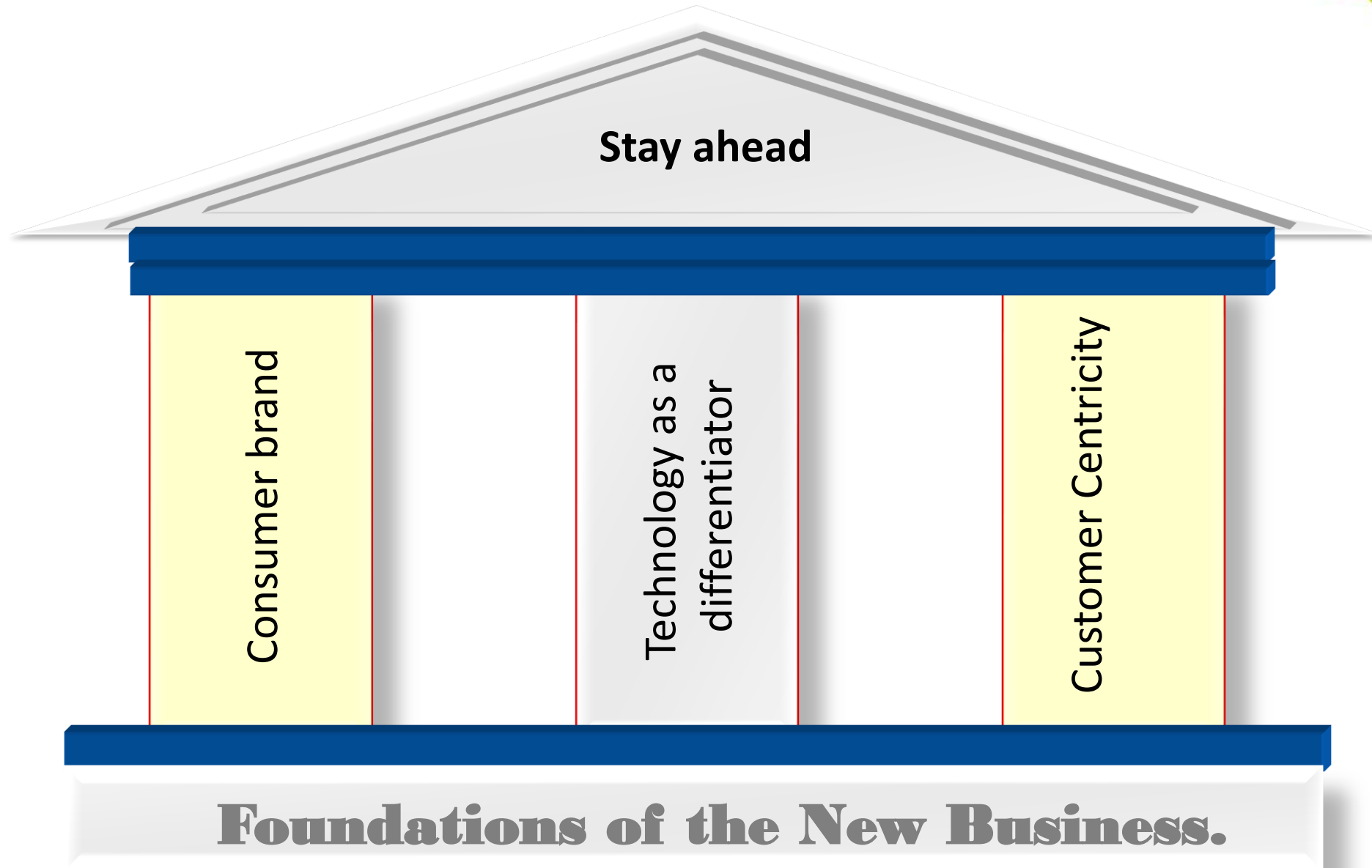
Chennai

Covering over 60 cities currently

And Leverage the Power of the Group !



Focal Points of New Businesses



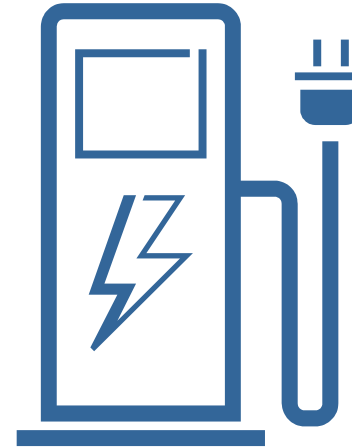
Now Charging at a point near you



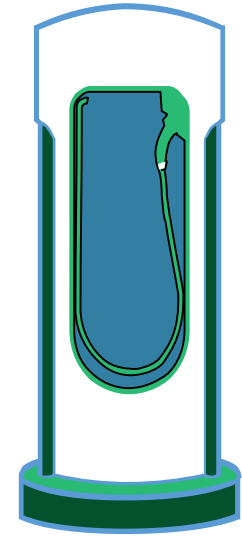
Home



Workplace



Captive



Public

Retail users, fleet owners, battery swap stations, corporate transportation, Bus operators ...

Focus Segments for Public Charging



Highways

Hotels

Workplaces

Tourist Destinations

Malls/ Shopping

RWAs



E- BUS Charging



BEST buses in Mumbai..

End to End Execution

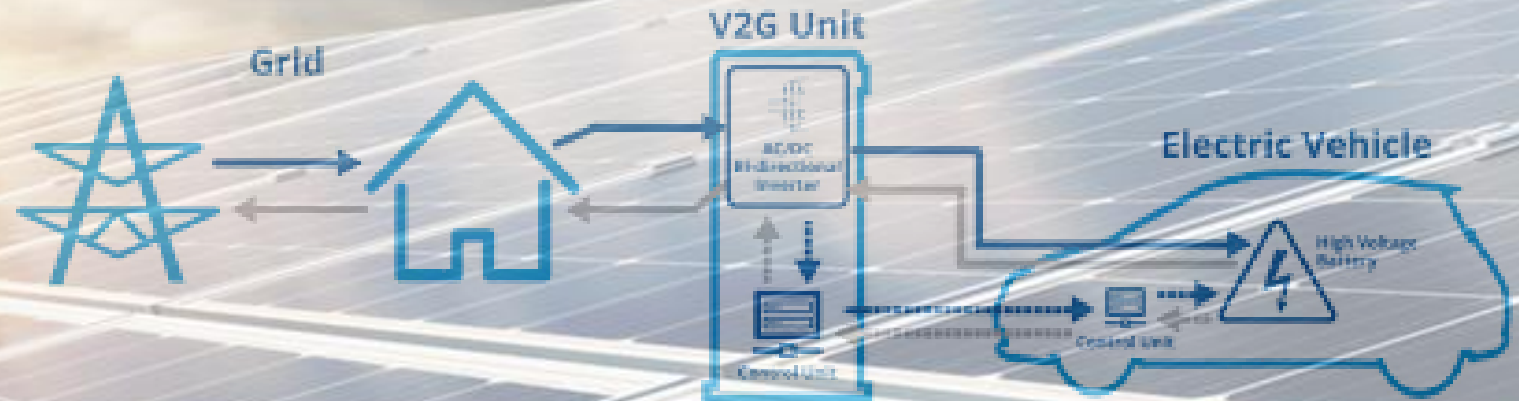
- Power Infra Structure
- Civil Infrastructure
- Charging Infrastructure



- **Vehicle to Grid**

- **2nd Life of Battery**

- **Total Sustainable Solutions**





Challenges faced

Challenges to a C.P.O



Real Estate & Location of Charging or Battery Swapping Stations

Battle of the Standards

Inconsistent EV tariffing

Long road to a Business Case



Invest ahead of time..

Spur the ecosystem

Be the largest

Be the best ..

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Thank You!