



Overview and market perception of consumers towards electric mobility in Ghana

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RATIONALE FOR ELECTRIC MOBILITY

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Urban Transport System

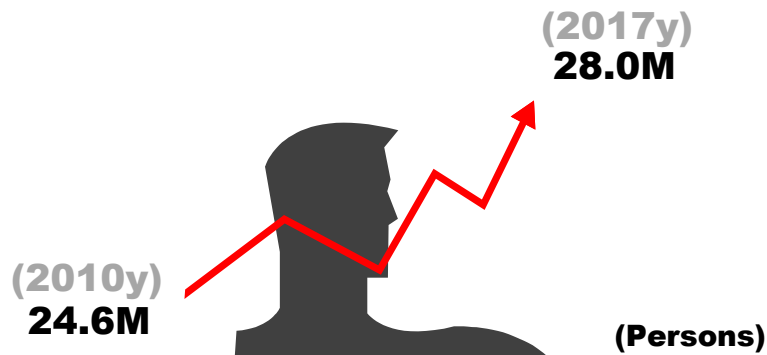
- **Population : 28.0million**

- **Vehicles : 2.2million**

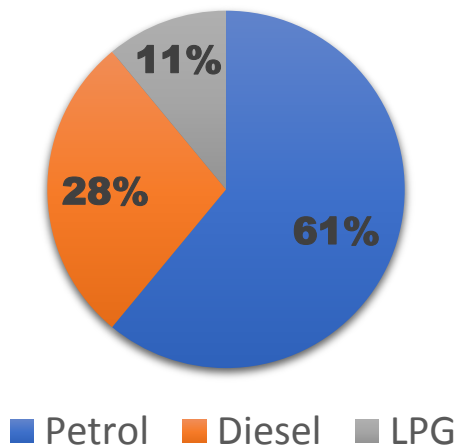
- **Area : 239,460km²**

- **Road : 73,000km**

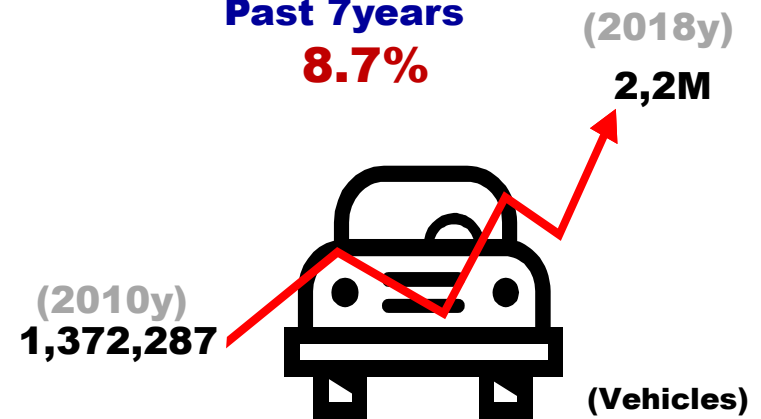
Past 7years



Fuel Types

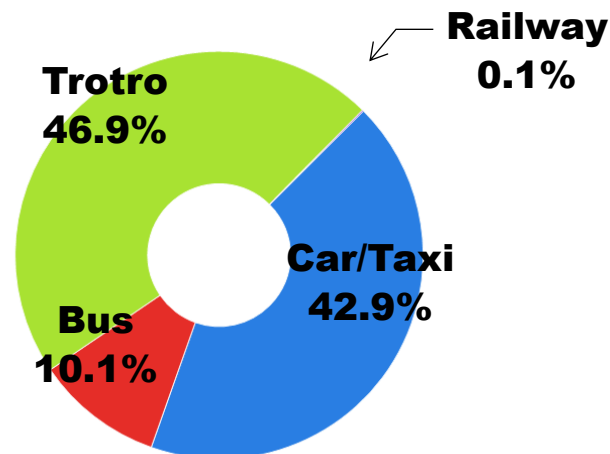


Past 7years



Source : DVLA

Modal Split





Development Issues of the Sector

Road Transport Services



- Lack of operational standards for public transport services
- Poor transportation management particularly in urban areas
- Inadequate facilities for PWDs in the transport system
- Weak enforcement of road traffic regulations
- High incidence of road accidents
- Congestion and poor air quality within urban areas



Development Issues of the Sector





Development Issues of the Sector

- Severe congestion occurs in AM/PM on major arterial roads

- Travel Speed(AM) : to CBD



- Travel Speed(PM) : to Outskirts





Development Issues of the Sector

- 2012 Air quality data available indicate that 75% of the samples collected at roadside locations in Accra exceed the national 24-hour mean limit value of $70 \mu\text{g.m}^3$ for PM_{10} .
- For NO_2 , 40% of the samples collected exceeded the annual WHO guideline of $40 \mu\text{g.m}^3$.



Development Issues of the Sector





RATIONALE FOR ELECTRIC MOBILITY

- Ghana Nationally Determined Contributions support promotion of sustainable mass transportation systems
- Potential CO₂ emission reduction
- Improved fuel economy - Improved fuel efficiency
- Local air pollution - Avoided NO_x, PM or black carbon
- Low carbon technology transfer – development of local skills (artisans, operators, garage)
- Contribute to Paris Agreement limiting Global Warming (<2 C)



CONCEPT OF ELECTRIC MOBILITY

- Electric vehicle (EV) is a relatively new concept in the sub-region.
- Traditional conventional vehicles produce a high amount of carbon emissions that contribute to pollution, greenhouse gases and climate change.
- The cost of running a fossil fuel vehicle is higher (cost per mile)
- Electric Mobility policies have been largely on the following:
 - ☐ Purchase cost
 - ☐ Charging infrastructure
 - ☐ Maintenance
 - ☐ Creating public awareness and acceptance



CONCEPT OF ELECTRIC MOBILITY

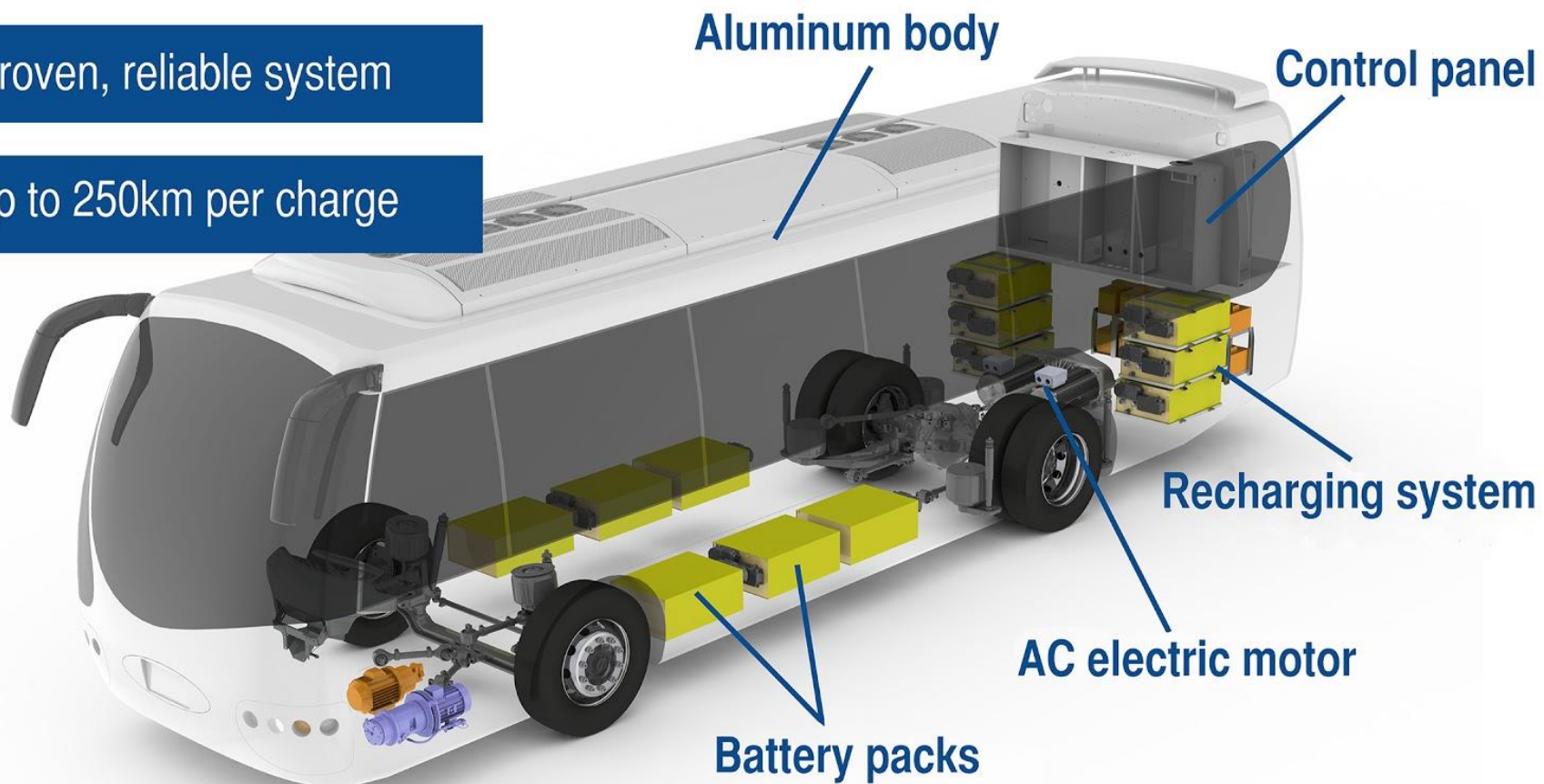




ELECTRIC MOBILITY

Proven, reliable system

Up to 250km per charge





CHARGING INFRASTRUCTURE

ICE Vehicle



Electric Vehicle*



Range	<p>~300 miles per refuel (~480 km)</p> 	<p>~100 miles per charge (~160 km)</p> 
Time to Refuel	<p>5 minutes</p> 	<p>35~40 minutes (Fast Charging)</p>  <p>8 hours (Slow Charging)</p>



Charging Technologies

1. *Conductive charging technology*

Plug-In



Overhead Wires



Pantograph



Power:
< 650 kW
Efficiency:
> 99.5 %

2. *Inductive charging technology*

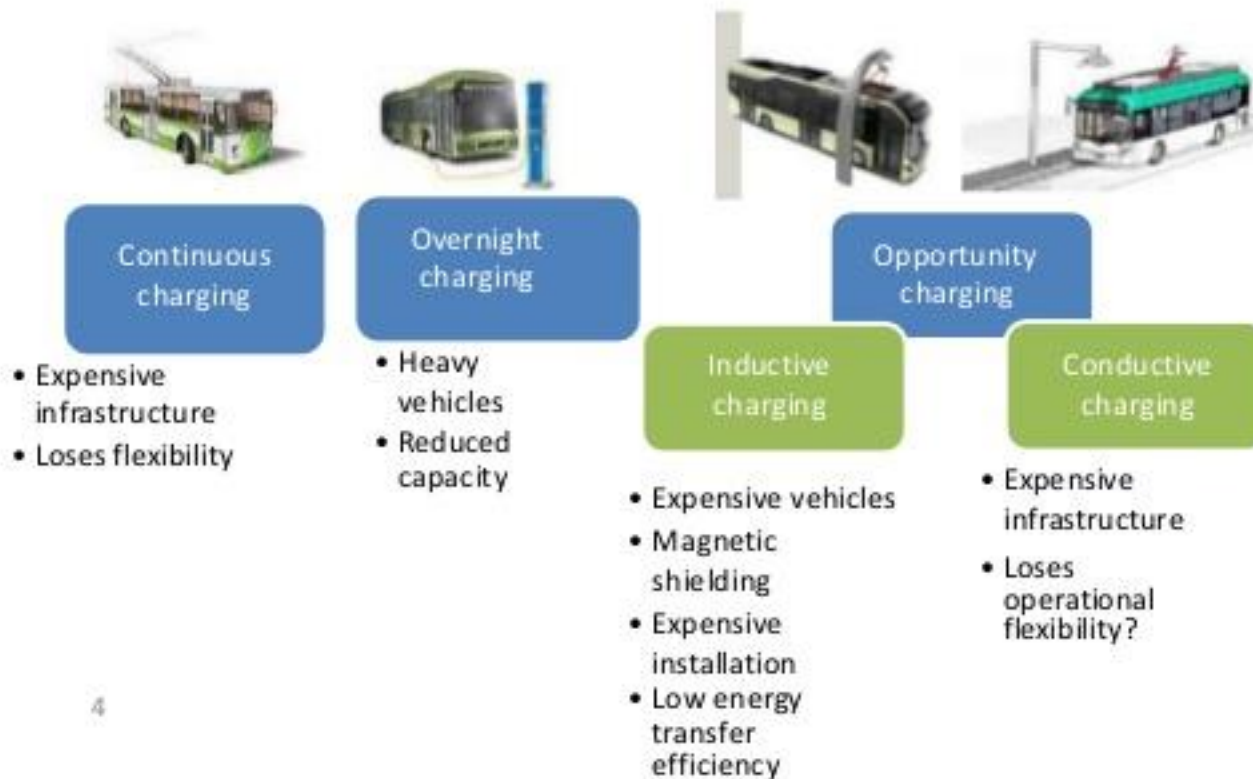


Power:
< 300 kW
Efficiency:
80-95 %



CHARGING INFRASTRUCTURE

ELECTRIC BUSES: OPTIONS FOR CHARGING OF VEHICLES





- **Fiscal and non fiscal policy measures**

- ☐ Charging infrastructure for EVs at public places
- ☐ Home charging application
- ☐ Cost of EVs: US\$25,000 to US\$85,000 for a standard electric car
- ☐ Fuel efficiency
- ☐ Emission standard
- ☐ Maintenance and service cost,
- ☐ Comfort features
- ☐ Maintenance and after sales services support cost (replacement and disposal of batteries)
- ☐ Purpose (private/ commercial)



KEY CONSIDERATIONS FOR ELECTRIC MOBILITY

- **Buyer's Preference**

- ☐ Affordability (cost of EVs is around 2 to 2.5 times more than a comparable conventional vehicle)
- ☐ Performance (depends on battery capacity, higher range result in higher price)
- ☐ Durability

- **User Friendliness**

- ☐ Ease Of Charging (does not require dedicated)
- ☐ Maintenance (EV offer a significant advantage on operating cost (running plus maintenance cost) which could be as low as 1/4th of that of a conventional vehicle)
- ☐ EV for commercial operations reduces operating cost
- ☐ Low mileage for personal mobility (high investment cost)



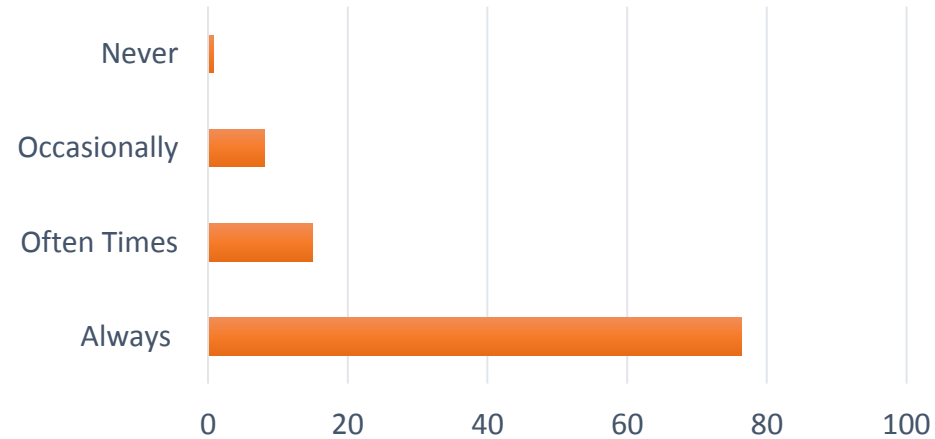
POLICY MEASURES ON VEHICLES IMPORT & USE

- Ghana Customs, Excise and Preventive Service (CEPS) (Management Law) PNDCL 330 of 1993
- CET Act of 2015, Act 905
- HDL and valuation of Imported vehicles under section 60 Of Customs Act, 2015 (Act 891)
- Over aged vehicle import penalty: impose penalties on vehicles older than 10 years
- Luxury Vehicle Tax
- Vehicle financing by Banks in Ghana
- Fleet Renewal Policy, 2010
- Low Sulphur Reduction Strategy

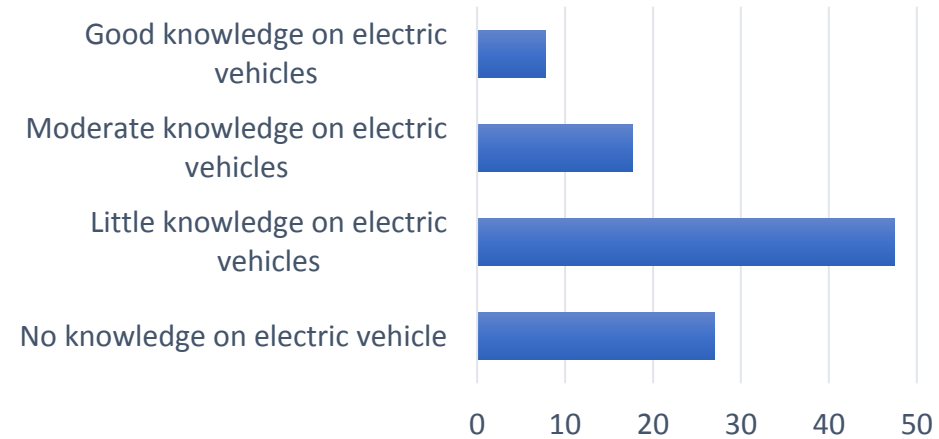


CONSUMER AWARENESS AND KNOWLEDGE

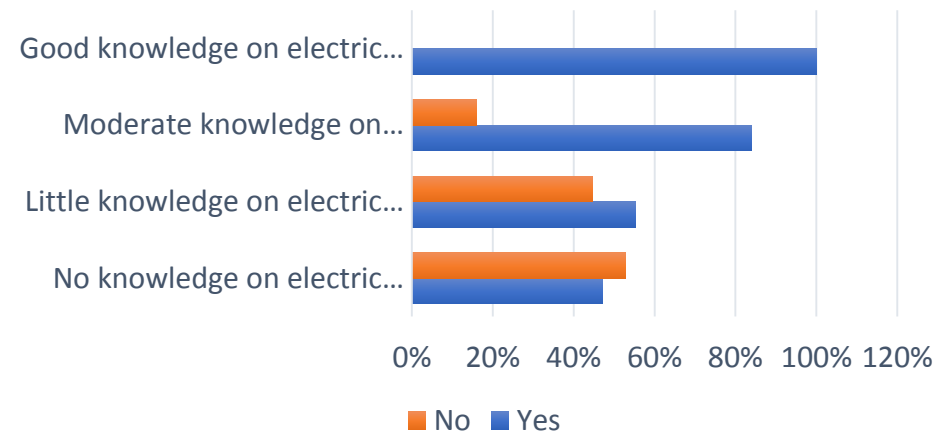
Concerned about Air Pollution



Knowledge on EV

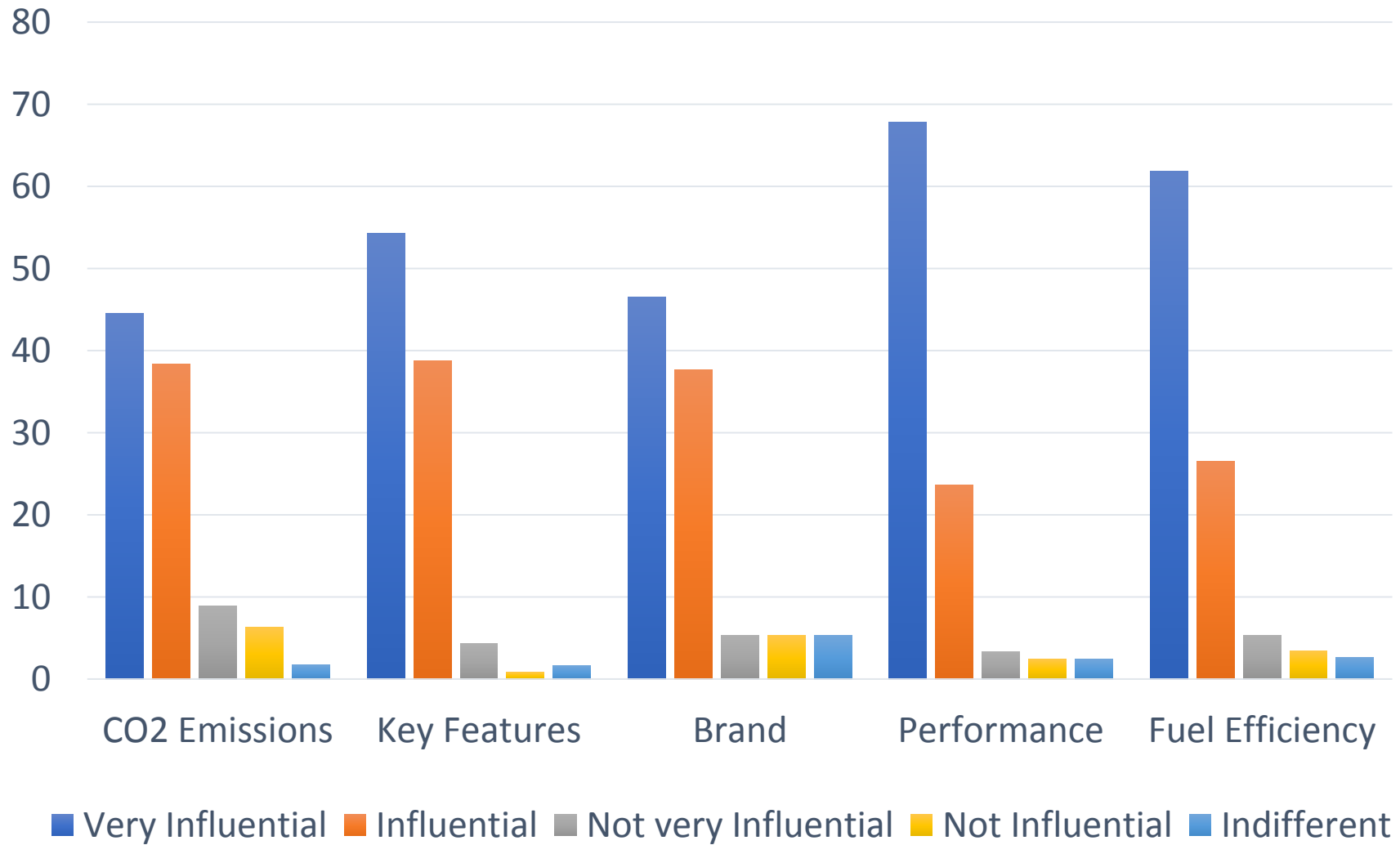


Knowledge/ownership



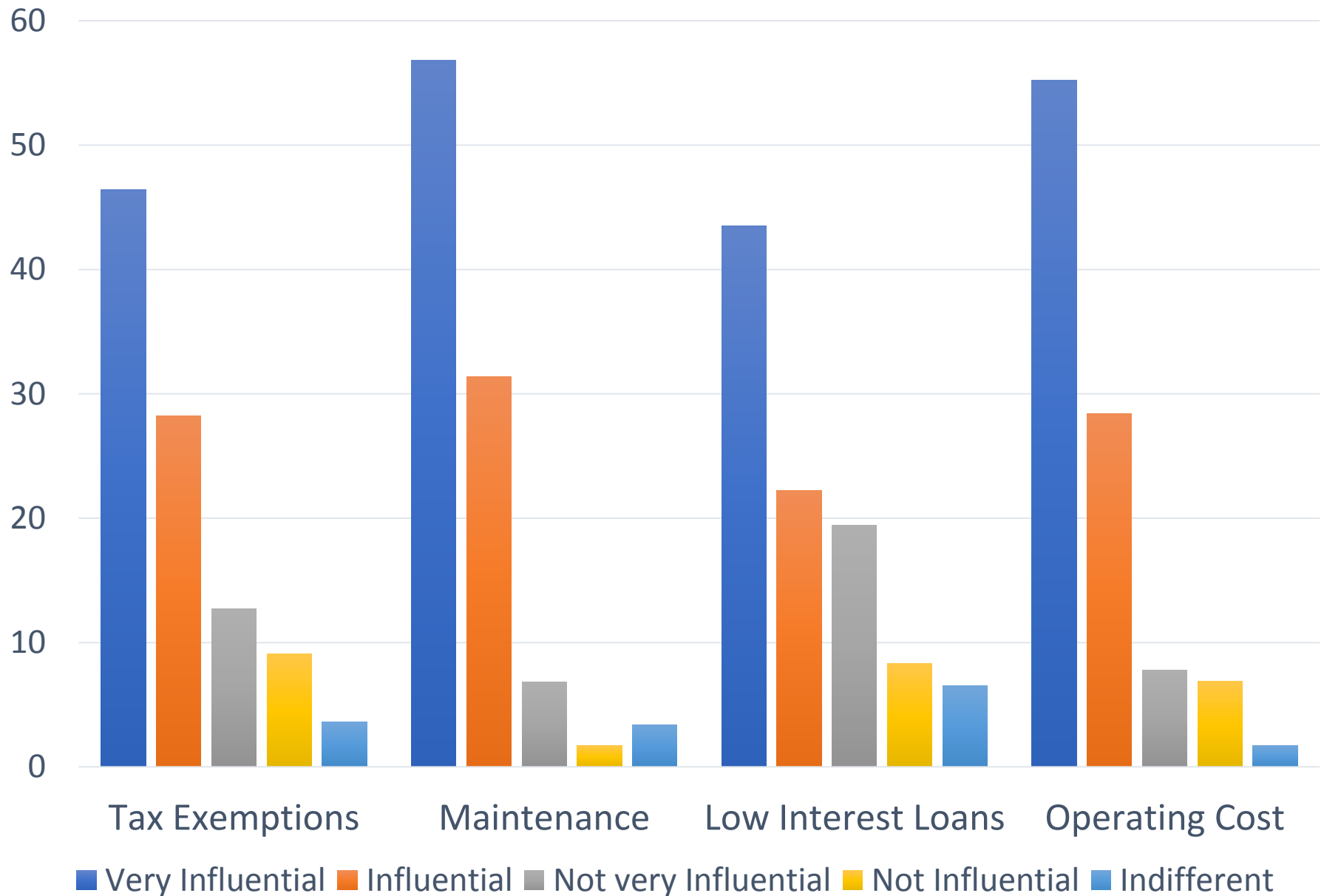


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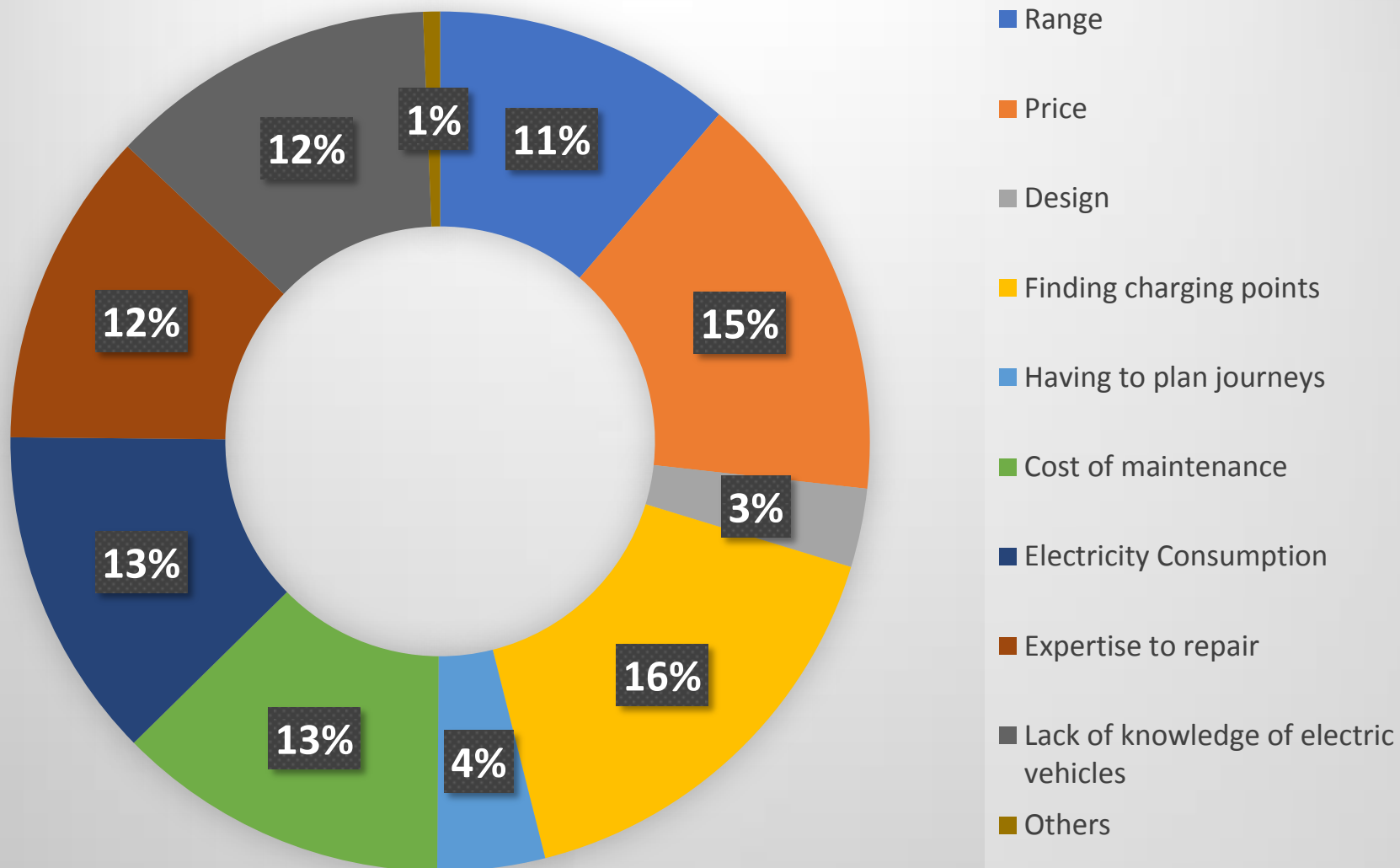


CONSUMER AWARENESS AND KNOWLEDGE





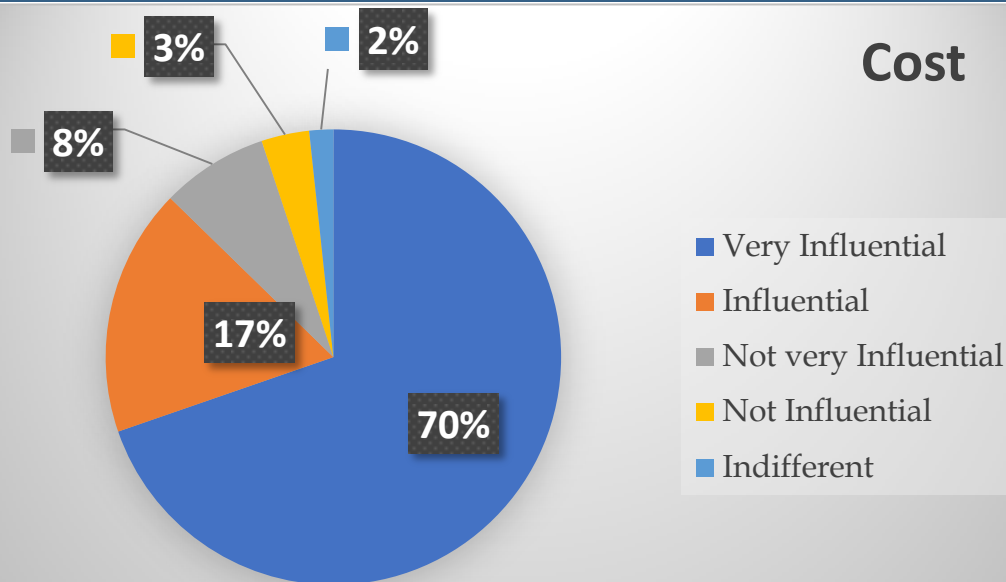
Potential Barriers to Electric Mobility



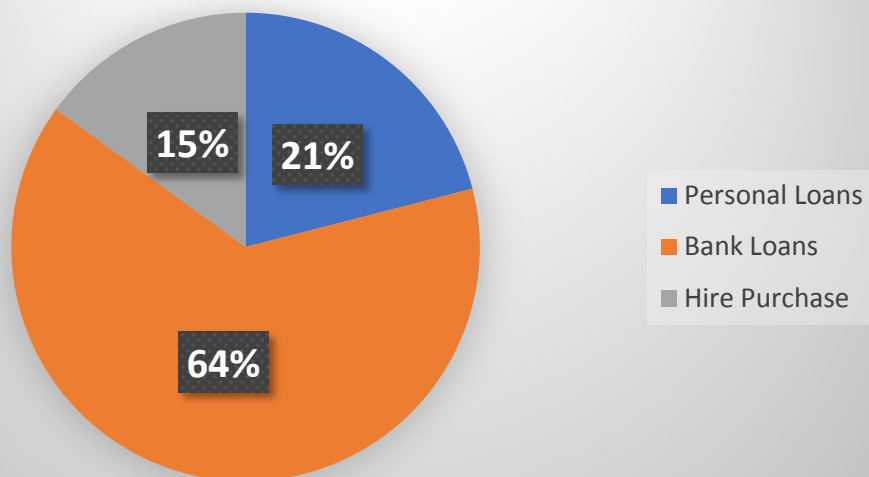


Potential Barriers to Electric Mobility

Cost



Finance Options





SUMMARY OF KEY BARRIERS

- Cost
- Performance (range, fuel efficiency)
- Interest on loans
- Local taxes
- Maintenance
- Operating Cost (stable supply of electricity and tariff etc.)
- Charging Infrastructure
- Knowledge Gap and awareness creation
- Replacement and disposal of batteries



Policy Recommendations

- Policy measures have different level of impact on the market
 - ☐ Cost: revision of Import levies in favour of EV
 - ☐ Interest: Government to collaborate with banks to offer cheaper or interest free loans to finance EV. (Similar to Car loan offered to Public Servants by MOF)
 - ☐ Rate of depreciation of 80% instead of 40% for vehicles older than 3 years in favour of EVs
 - ☐ Tax waivers
 - ☐ Road tolls, exemptions



Policy Recommendations

- Non-fiscal measures fiscal sustained over a longer term to have a greater impact on adoption
 - ❑ Performance: Depending on battery capacity but improves with technology
 - ❑ Maintenance: Encourage the Private Sector to build capacity for aftersales service support
 - ❑ Operating cost: negotiated tariffs for public charging facilities, Options to also use solar charging- low operating cost for commercial usage
 - ❑ Charging Infrastructure: Support for the private sector to invest develop and manage public charging facilities. Encourage property developers to include EV infrastructure in designs
 - ❑ Battery production, Leasing and swapping (cylinder circulation)
 - ❑ Congestion charging with Permits for EVs
 - ❑ Education and awareness creations on EVs
 - ❑ Phased introduction into existing public transport fleets

**THANK
YOU**