Energy Transformation In the Transport Sector

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Drive Electric Study: 2 year study of e-Mobility

**YEAR 1**
- Test a Used EV
- Energy Economy: EV vs ICE
- Capex Vs Opex study

**YEAR 2**
- Test of new EV – ENV-200
- Targeted Sampling of Evs
- Study of market potential
- Driving pattern sampling

**YEAR 3:**
- Study of policy framework
- Who are key Stake holders
- Barriers to adoption
PHASE 1: TESTING THE TECHNOLOGY A USED EV VS USED ICE

Local Cost of Ownership USD 6,000

Usage: Technical field work; Light Cargo; Light equipment and tool boxes, Company Errands, Daily commuting to work for technical staff

Local Cost of Ownership USD 13,000

Usage: Field work, Urban transport, Light equipment and tool boxes, Company Errands, Daily commuting to work for technical staff, Business Meetings, Sales & Marketing, ;4
Driving Pattern for Study Vehicles

ICE; KBN 429L
Daily average = 75km

EV; KCG 225T
Average Daily Distance=90km
Driving Pattern for Study Vehicles

EV; KCM 531J
Average Daily Distance=60 km

EV; KCM 036D
Average Daily Distance=35 km
## Phase 1

### Sampled results

- **Cost of ownership**
- **Suitability**
- **Cost of Maintenance**
- **General Performance**

<table>
<thead>
<tr>
<th>Study Parameter</th>
<th>Electric Car Nissan Leaf</th>
<th>Petrol Vehicle Nissan Advan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual Energy Cost</td>
<td>KES 33,745.42 for 11,005km</td>
<td>KES 126,558.65 for 11,005km</td>
</tr>
<tr>
<td>Cost of Maintenance (Engine related service schedule)</td>
<td>Nil service was schedule at 12,000km</td>
<td>Service schedule Every 5,000Km</td>
</tr>
<tr>
<td>Energy Cost /KM travelled</td>
<td>Ksh 4 per km. 120 Km full charge Kes 20.91/KWh; Average fuel economy 5km/KWh)</td>
<td>Ksh 8 per km. (Consumption 12.68km/l Average Petrol Cost of kes 106.3/L</td>
</tr>
<tr>
<td>CARGO AND PASSENGER</td>
<td>Compact Car Body Style: 5 door Hatch-back Perfect passenger space and room for cargo.</td>
<td>5 Door Wagon Perfect passenger space and room for cargo.</td>
</tr>
<tr>
<td>TAIL PIPE CO2 EMISSIONS PER KM</td>
<td>ZERO</td>
<td>411gm of CO2 per 1.6km</td>
</tr>
</tbody>
</table>
RESULTS AND FINDINGS

MONTHLY COST COMPARISON YEAR 2017

ANNUAL COST COMPARISON

EV cost
ICE cost
Phase 2
Leased option

- Acquire independent opinion on acclimatization of used EVs in Kenya.
- Collecting feedback from consumers targeted road users

Main Queries Centered on

- Range anxiety
- Charging infrastructure.
- Technology questions - Is the EV battery affected when the car is driven in water?
- Capex and Opex questions - The high initial costs scare away new buyers. A policy framework can trigger the uptake of this technology
Phase 3

- **Incentives Rebates**
  - Provides an essential link for co-operation

- **TREASURY**
  - Phase 3

- **Ministry of Energy**
  - Charging infrastructure development and Use of Renewable energy

- **Ministry of Transport**
  - Policy, Planning and development of infrastructure.

- **Ministry of Environment**
  - Decarbonising the transport sector

- **Manufacturers KAM**
  - Work with countries and its strategic partners to support a shift to e-Mobility assist Kenya in developing electric

- **UNEP**
  - Air quality improvement capacity building

- **ITDP**
  - They have a commercial interest in the rollout of electro mobility

- **Ministry of Health**
All over the world, governments attempt to support the transition to e-mobility. The introduction of electric driving is a complex and unpredictable process that is not likely to occur all by itself.

**Strategies to accelerate EV deployment**

**Awareness**
- EV showcases and demonstration zones.
- Youth education and professional development.
- Awards and recognition
- Highly visible signage.
- Informational Websites
- National Drive Electric Week promotional events
- Encourage elected officials to drive EVs.

**Infrastructure**
- Providing direct financial incentives for setting up of infrastructure
- Investing in government-owned infrastructure.
- Partnering with EV stakeholders to ensure charging stations are accessible to the public.
- Adopting accredited standards to allow and encourage installation of charging stations throughout the city.

**Policy**
- Lower import duties and road tax for electric vehicles
- Preferential access and exemption from congestion fees in urban areas
- Adopt EV-friendly zoning and parking ordinances.
- Identify other policies and incentives that may promote EV use, such as free parking for EVs, or tax credits for businesses that offer EV charging.
ECO-HUB
STRATEGY FOR INITIAL INFRASTRUCTURE DEVELOPMENT

- **Staff/School Bus** for staff or students
- **Personal Car** for personal utility
- **Delivery Bike** for errands or deliveries
- **Delivery Van** for errands or deliveries
- **EV Bus for staff or students**
- **EV motorbike for errands or deliveries**
- **EV for personal utility**

SCHOOL | AIRPORT | OFFICE | HOTEL | COMPANY
Eco-Hub

• Eco-Hub introduces solar power for charging stations.
• The Eco-Hub owner is a power generator, and uses the power to meet varied demand needs.
• Power from solar charges EVs and surplus can be fed to immediate loads e.g. lighting and office electrical loads.

BENEFITS OF ECO-HUB

• Energy Security – Solar power protects the off-takers from fluctuating energy prices and unreliable grid power.
• Costs savings – We saved 78% with our EV on fuel costs alone (from table). With ECO-HUB, the cost of electricity is zero.
• Freedom to choose between ICE and EV car technologies.
• Commercial and Industrial fleet owners have a concrete data source for turning their fleets to EVs.
• Zero-emission from the EVs will improve on air quality, de-carbonize our transport system.
• Wide range market potential, from homes, institutions, shopping malls e.t.c.
TO MEET OUR CARBON NEUTRALITY GOALS, IT IS CRITICAL THAT WE ELECTRIFY THE TRANSPORTATION SECTOR

The experience of cities with the highest rates of EV adoption demonstrates that local government can play a significant role in accelerating the transition to electric transportation by addressing the most significant barriers to EV adoption.

Nairobi has a unique opportunity to improve air quality and public health, advance environmental justice, and reduce the economic risks of fossil fuel dependence and worsening climate change through policies and programs which support electric vehicles.
THANK YOU

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