Establishment of e-Mobility Ecosystem for Carbon Reduction in Cambodia

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Introduction

1. Global Emissions by Transport Sector
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Introduction
1. Global Emissions by Transport Sector

The transport sector now responsible for 15% of greenhouse gas emission. It is the fastest-growing GHG emitting sector, expected to reach a share of more than 30% in the future.
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2. Transition Towards Low Carbon e-Mobility

Motorcycle is one of the major pollutant in the transportation sector in the Southeast Asian countries where there is a lack of public transportation.

Low Carbon e-Mobility

- It is believed that Low Carbon e-mobility can not contribute to carbon reduction but also reduce pollution.
- Also creating jobs, making streets safer, strengthening infrastructure and stimulating local economies.

Projected Global Electric Motorcycle Market Size

<table>
<thead>
<tr>
<th>Year</th>
<th>Capacity (in billion U.S. dollars)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2024</td>
<td>61</td>
</tr>
<tr>
<td>2025</td>
<td>67.1</td>
</tr>
<tr>
<td>2026</td>
<td>74</td>
</tr>
<tr>
<td>2027</td>
<td>81.6</td>
</tr>
<tr>
<td>2028</td>
<td>89.9</td>
</tr>
<tr>
<td>2029</td>
<td>99.2</td>
</tr>
<tr>
<td>2030</td>
<td>109.5</td>
</tr>
</tbody>
</table>

CAGR of 2024–2030: 10.24%

Source: www.statista.com

e-Mobility Market share, by battery, 2023

- Li-ion Battery: 87.6%
- SLA Battery: 12.4%

* SLA: Sealed Lead Acid Battery

KOREA

1st Target market

200m unit

100 times

Asia-Pacific Dominates the Market

81%
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II Partnership Model

KEA and KOICA have partnered with Private Sector to address the issue in Cambodia, and Beyond

Resource Partners

- **Korea Energy Agency**
  - Energy Policy Consulting for Cambodia
  - Cambodia e-Mobility Plan Using Solar Power

- **KOICA**
  - Development Effectiveness + Business Feasibility

Implementation Partners

- **VeryWords**
- **Kodac**

Collaborators

- **Wooribank**
- **Royal Univ of Phnom Penh**
- **GGG**

Grant Aid

- **Ministry of Public Works and Transport**

Market Based

- **Venture Capitals**
- **Royal Uni of Phnom Penh**

Energy Policy Consulting for Cambodia

Development Effectiveness + Business Feasibility
III E-Mobility EcoSystem in Cambodia

1. Creating a Circular Economy
2. Motorcycle Market Analysis
3. E-Mobility ECO-PLATFORM
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1. Creating a Circular Economy

### E-Mobility Eco-Platform

#### Battery Swapping e-Mobility

Local Assembly Factory, In Cambodia

- IoT- Embedded

#### Charging Infrastructure

- "high-quality products, with 80% KOREA Parts components"

### Cambodia-side

- E-Mobility
- Battery Reuse (ESS)
- Battery Recycle Center

### South Korea-side

- Battery Factory
- Battery Recycle Factory

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max Speed</td>
<td>Max 80km/h (65km/h for consumers)</td>
</tr>
<tr>
<td>Distance Range</td>
<td>&gt; 100km (50km/h Speed Test)</td>
</tr>
<tr>
<td>Battery</td>
<td>2.88kWh (72V 40Ah, Lithium)</td>
</tr>
<tr>
<td>Motor</td>
<td>3,000 W</td>
</tr>
<tr>
<td>IOT Module</td>
<td>Real-time location / Battery check / Remote lock, unlock</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>Standard / Expansion</td>
</tr>
<tr>
<td></td>
<td>*Eco 6 Module, 10 battery charging/storage slots</td>
</tr>
<tr>
<td></td>
<td>*Exp 12 Modules, 20 battery charging/storage slots</td>
</tr>
<tr>
<td>Power</td>
<td>2.7kW 10A - 5.5kW 20A</td>
</tr>
<tr>
<td>Basic Dispenser Module</td>
<td></td>
</tr>
</tbody>
</table>
### 2. Motorcycle Market Analysis

<table>
<thead>
<tr>
<th>Type</th>
<th>Measure</th>
<th>2024</th>
<th>2025</th>
<th>2026</th>
<th>2027</th>
<th>2028</th>
<th>2029</th>
<th>2030</th>
<th>2031</th>
<th>2032</th>
<th>2033</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Motorcycles</td>
<td>1,000 units</td>
<td>6,989</td>
<td>6,216</td>
<td>6,441</td>
<td>6,665</td>
<td>6,887</td>
<td>7,107</td>
<td>7,325</td>
<td>7,766</td>
<td>8,208</td>
<td>8,640</td>
</tr>
<tr>
<td>Total E-Motorcycles</td>
<td>1,000 units</td>
<td>300</td>
<td>467</td>
<td>645</td>
<td>834</td>
<td>1,034</td>
<td>1,245</td>
<td>1,466</td>
<td>1,748</td>
<td>1,942</td>
<td>2,258</td>
</tr>
<tr>
<td>%</td>
<td>%</td>
<td>5%</td>
<td>7.5%</td>
<td>10%</td>
<td>12.5%</td>
<td>15.5%</td>
<td>17.5%</td>
<td>20%</td>
<td>22.5%</td>
<td>25%</td>
<td>27.5%</td>
</tr>
<tr>
<td>VW Sales expected</td>
<td>1,000 units</td>
<td>8</td>
<td>20</td>
<td>40</td>
<td>75</td>
<td>107</td>
<td>149</td>
<td>202</td>
<td>277</td>
<td>346</td>
<td>448</td>
</tr>
<tr>
<td>Chargers</td>
<td>units</td>
<td>105</td>
<td>145</td>
<td>275</td>
<td>393</td>
<td>550</td>
<td>740</td>
<td>1,010</td>
<td>1,270</td>
<td>1,640</td>
<td>2,080</td>
</tr>
<tr>
<td>GHG reduction</td>
<td>tCO2eq</td>
<td>2,859</td>
<td>11,013</td>
<td>21,880</td>
<td>35,361</td>
<td>52,626</td>
<td>74,218</td>
<td>102,041</td>
<td>138,800</td>
<td>182,157</td>
<td>231,585</td>
</tr>
</tbody>
</table>
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### II. Partnership Model

### III. E-Mobility EcoSystem in Cambodia

#### 3. E-Mobility ECO-PLATFORM(1/2)

- **Assembly Factory & Location**

**POOPLE e-Mobility Factory in Phnom Penh, Cambodia**

- Celebrating first mass production
- Location in Mekong Logistics complex
- Charging station production
- '23.05.26 Opening Ceremony
- Delivery for pre-booking
- '23.05 Initial production (100 units)
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3. E-Mobility ECO-PLATFORM(2/2)

First non-CO2 Tour Operating at the Angkor Wat, Cambodia
IV ITMO Vision
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IV. ITMO Vision

**Korea's 2030 Overseas GHGs Reduction Target**
37.5 million tCO₂eq
[approx. 2.4 billion USD per year]

**DOE** (Designated Operational Entity)

**Methodology of GHGs Reduction Project**
- CDM, AMS-III.C Emission reductions by electric and hybrid vehicles (V16.0)

The amount of GHGs reduction
- 2025~2034: 811,970 tCO₂ eq.
- 2035~2044: 7,848,006 tCO₂ eq.
The Future

1. E-Vehicle Ecosystem: Beyond Mobility to Smart Grid
2. What’s on the horizon?
The Future

1. E-Vehicle EcoSystem: Beyond Mobility to Smart Grid

Vehicle-to-Grid (V2G) Model should be considered for newly established e-Vehicle ecosystem.

**Requirements**

1. EV Readiness
2. Smart Charger
3. Institutional Reform
4. Financial Incentives

**Electric Vehicle Ecosystem**

- eMobility Service Provider (eMSP)
- eRoaming Operator
- Charging Point Operator (CPO)
- Electric Vehicle (EV)
- Grid to Vehicle (G2V) / Vehicle to Grid (V2G)
- Charging Points

A half–million school buses across US could become EV battery powerhouse feeding energy back onto the grid

"Hyundai and We Drive Solar launch energy system of the future in Utrecht"
Thank You