

**Pilot Green Transport Fund**

**Interim Report**

**On**

**Trial of Electric Light Goods Vehicle for**

**Retail Industry**

**(Kau Kee Development Limited)**

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PREPARED BY:  
Dr. W.T. Hung

The Monitoring and Evaluation Team's views expressed in this report do not necessarily reflect the views of the Environmental Protection Department, HKSAR.

## **List of Monitoring and Evaluation Team Members**

**Dr. C.S. CHEUNG (Team Leader)**

Department of Mechanical Engineering  
The Hong Kong Polytechnic University

**Dr. C. NG**

Department of Mechanical Engineering  
The Hong Kong Polytechnic University

**Mr. KS Tsang**

Department of Mechanical Engineering  
The Hong Kong Polytechnic University

**Dr. Edward WC Lo**

Department of Electrical Engineering  
The Hong Kong Polytechnic University

**Dr. W.T. HUNG**

**PolyU Technology and Consultancy Company Limited**  
The Hong Kong Polytechnic University

**Pilot Green Transport Fund  
Trial of Electric Light Goods Vehicle for Retail Industry  
(Kau Kee Development Limited)**

**Interim Report  
(Trial Period: 1 January 2020 – 31 December 2020)**

**Executive Summary**

**1. Introduction**

1.1 The Pilot Green Transport Fund (the Fund) is set up to encourage transport operators to try out green innovative transport technologies, contributing to better air quality and public health for Hong Kong. Kau Kee Development Limited (Kau Kee) was approved under the Fund for trial of one electric light goods vehicle for goods delivery service. Through the tendering procedure stipulated in the Subsidy Agreement signed with the Government, Kau Kee procured a NISSAN e-NV200 light goods vehicle (EV) for trial.

1.2 PolyU Technology and Consultancy Company Limited has been engaged by the Environmental Protection Department (EPD) as an independent third party assessor (the Assessor) to monitor the trial and evaluate the performance of the trial vehicle. Kau Kee assigned a diesel light goods vehicle (DV) providing the same type of service for comparing with the EV.

1.3 This Interim Report summarizes the performance of the EV in the first twelve months of the trial as compared with its conventional counterpart, i.e. the DV.

**2. Trial and Conventional Vehicles**

2.1 Key features and photos of the EV and DV are shown in Appendix 1 and Appendix 2, respectively. The two vehicles were used for goods delivery service in retail industry. The EV served Taipo, Tsuen Wan and Central & Western areas, whilst the DV served Tsim Sha Tsui, Tsuen Wan and Central areas. According to the EV's manufacturer, the EV's gross vehicle weight is 2,250 kg and it has a driving range of 317 km (air conditioning off).

2.2 Kau Kee installed a charging station at its own cost at its Fanling depot. However, due to the operational need, the EV was usually charged at carparks in Taipo and Tsuen Wan overnight. The electricity consumption was calculated from the records of percentage of battery charged and the battery capacity, i.e., multiplying the electricity percentage charged with the battery capacity.

### 3. Trial Information

3.1 The trial started on 1 January 2020 and would last for 24 months. Kau Kee was required to collect and provide trial information including the EV mileage reading before charging, amount of electricity consumed in each charging, time taken for charging, operation downtime due to charging, cost and downtime associated with scheduled and unscheduled maintenances of the EV. A similar set of data from the DV was also required. In addition to the cost information, reports on maintenance work, operational difficulties and opinions of the driver and Kau Kee were collected to reflect any problems of the EV.

3.2 Table 1 summarizes the statistical data of the EV and DV. The average fuel cost of the EV was HK\$1.05 (about 84%) lower than that of the DV. The saving in average total operating cost of the EV over the DV was HK\$0.97 (about 78%).

Table 1: Key operation statistics of each vehicle (1 January 2020 – 31 December 2020)

		EV	DV
Total distance travelled (km)		45,839	40,649
Average daily distance traveled (km/day)		155	152
Average fuel economy	km/kWh	6.20	
	km/litre		11.39
	km/MJ	1.72	0.32 <sup>[1]</sup>
Average fuel cost (HK\$/km) <sup>[2]</sup>		0.20	1.25
Average total operating cost (HK\$/km) <sup>[3]</sup>		0.28	1.25
Downtime (working day) <sup>[3][4]</sup>		2	30
Utilization rate (%)		99	90

<sup>[1]</sup> Assuming lower heating value of 36.13 MJ/litre for diesel fuel

<sup>[2]</sup> The market fuel price was used for calculation

<sup>[3]</sup> Maintenance due to incident not related to the performance of the vehicle was not included for comparing the performance.

<sup>[4]</sup> Downtime refers to the equivalent number of working days in which the vehicle is not in operation due to maintenance, counting from the first day it stops operation till the day it is returned to the operator.

3.3 During this reporting period, the EV had one scheduled maintenance involving maintenance for renewal of annual vehicle license causing 2 days downtime but no unscheduled maintenance. The DV had no scheduled maintenance but one unscheduled maintenance which involved the engine broke down; the vehicle was eventually retired and replaced by another diesel light goods vehicle, causing 30 days downtime.

3.4 There were 297 working days for EV and DV in the reporting period. The utilization rates of the EV and the DV were 99% and 90% respectively.

#### **4. Summary**

4.1 In the first twelve months of the trial, the average daily mileage of the EV was 155 km, while that of the DV was 152 km. The average fuel cost and the average total operating cost of the EV were HK\$1.05/km (about 84%) and HK0.97/km (about 78%) lower than those of the DV. The utilization rates of the EV and the DV were 99% and 90% respectively.

4.2 The EV driver had no problem in operating the EV and was satisfied with its performance. The battery capacity was sufficient to support the full-day operation of the EV. Kau Kee was satisfied with the performance of the EV.

4.3 In this reporting period, the average fuel economy had a slight and gentle dropping trend. However, the EV and its charging frequency did not indicate any deterioration in the performance of the EV.

4.4 The findings only reflect the performance of the EV in the first twelve months of the trial. The performance and reliability of the EV will be continuously monitored in the 24 months of the trial.

## Appendix 1: Key Features of Vehicles

### 1. Trial EV

<b>Registration Mark:</b>	<b>WJ8371</b>
Make:	NISSAN
Model:	E-NV200 HALF PANELVAN (LGV)
Class:	Light goods vehicle
Gross vehicle weight:	2,250 kg
Seating Capacity:	driver + 4 passengers
Rated Power:	80 kW
Travel range:	317 km (air conditioning off)
Battery type	Lithium-ion
Battery capacity:	40 kWh
Year of manufacture:	2019

### 2. DV used for comparison

(From January 2020 to June 2020)

<b>Registration Mark:</b>	<b>TY8929</b>
Make:	VOLKSWAGEN
Model:	TRANSPORTER 2.0 TDI HL (6 SEATER)
Class:	Light goods vehicle
Gross vehicle weight:	2,800 kg
Seating Capacity:	driver +5 passengers
Cylinder capacity:	1,968 cc
Year of manufacture:	2015

(Starting from July 2020)

<b>Registration Mark:</b>	<b>NN1194</b>
Make:	TOYOTA
Model:	HIACE DIESEL LWB
Class:	Light goods vehicle
Gross vehicle weight:	2,800 kg
Seating Capacity:	driver +5 passengers
Cylinder capacity:	2,755 cc
Year of manufacture:	2017

## Appendix 2: Photos of the Vehicles

### 1. Trial EV – WJ8371

	
<p>Front view of EV</p>	<p>Right side view of EV</p>
	
<p>Left side view of EV</p>	<p>Rear view of EV</p>

## 2. DV used for comparison

DV - TY8929 (From January 2020 to June 2020)



Front view of DV



Right side view of DV



Left side view of DV



Rear view of DV



DV – NN1194 (Starting from July 2020)



Front view of DV



Right side view of DV



Left side view of DV



Rear view of DV