

Pilot Green Transport Fund

Interim Report

On

Trial of Electric Light Goods Vehicle for

Vehicle Maintenance Parts Transportation Service

(Kamwai Tyre Service Limited)

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PREPARED BY:
Dr. C. Ng

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. K.S. TSANG

Department of Mechanical Engineering
The Hong Kong Polytechnic University

Dr. Edward W.C. 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

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for Vehicle Maintenance Parts Transportation Service
(Kamwai Tyre Service Limited)**

**Interim Report
(Trial Period: 1 May 2021 – 31 October 2021)**

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. Kamwai Tyre Service Limited (Kamwai) was approved under the Fund for trial of one electric light goods vehicle. Through the tendering procedures stipulated in the Subsidy Agreement entered into with the Government, Kamwai procured a DFSK EC35, electric light goods vehicle (EV) for trial.

1.2 PolyU Technology and Consultancy Company Limited has been engaged by the Environmental Protection Department as an independent third party assessor to monitor the trial and evaluate the performance of the trial vehicle. Kamwai assigned a Toyota diesel light goods vehicle (DV) providing the same service as the conventional counterpart for comparison in this report.

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

2. Trial and Conventional Vehicles

2.1 The trial EV, DFSK EC35 electric light goods vehicle, has a gross vehicle weight of 2,330 kg capable of carrying a driver with four passengers and goods. It has a 41.4 kWh lithium-ion battery pack and the driving range is 300 km with air-conditioning off. A designated driver was assigned to drive the EV. The DV, Toyota KDH201RSSPDY 2,982 c.c. diesel light goods vehicle, was used as the conventional counterpart for comparison in this trial. The vehicles were used mainly for providing vehicle maintenance parts transportation service in the New Territories, Kowloon and Hong Kong Island.

2.2 Kamwai has installed a designated 7.2 kW, single phase AC charging facility for charging the EV. Key features of the EV and the DV as well as the EV charging facility are presented in Appendix 1. Photos of vehicles and the EV charging facility are shown in Appendix 2.

3. Trial Information

3.1 The trial commenced on 1 May 2021 and would last for 24 months. Kamwai is 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 and the charging facility. Similar data of the DV were also collected. In addition to the cost information, reports on maintenance work, operational difficulties and opinions of the driver were collected and provided to reflect any problems of the EV.

4. Findings of Trial

4.1 Table 1 summarizes the statistical data of the EV and the DV.

Table 1: Key operation statistics of each vehicle (1 May 2021 – 31 October 2021)

		EV	DV
Total distance travelled (km)		7,087	1,706
Average daily mileage (km/working day)		47	11
Average fuel economy	(km/kWh)	2.96	-
	(km/litre)	-	7.68
	(km/MJ)	0.82	0.21 ^[1]
Average fuel cost (HK\$/km) ^[2]		0.41	2.18
Average total operating cost (HK\$/km)		0.41	2.94
Downtime (working day) ^[3]		0	1

^[1] Assuming lower heating value of 36.13 MJ/litre for diesel fuel.

^[2] The market fuel price was used for calculation.

^[3] Downtime refers to the working days that 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.

4.2. During the 6 months of the trial, there were 150 working days. The total distance traveled and the average daily distance traveled of the EV were 7,087 km and 47 km/day, respectively while those of the DV were 1,706 km and 11 km/day, respectively. The average fuel cost of the EV was HK\$1.77/km (81%) lower than that of the DV. Taking maintenance fee into account, the average total operating cost of the EV was HK\$2.53/km (86%) lower than that of the DV.

4.3 The EV had no downtime while the downtime of the DV was 1 working day due to a scheduled maintenance. The utilization rates of the EV and the DV were 100% and 99%, respectively. In addition, there was no indication of deterioration in the EV performance.

4.4 The driver's view on the performance of the EV in this trial period was also collected. He had no problem in operating the EV and was satisfied with its performance.

5. Summary

5.1 In the first six months of the trial, the average daily mileage of the EV was 47 km, while that of the DV was 11 km.

5.2 The EV had a better fuel economy than the DV. The average fuel cost of the EV was HK\$1.77/km (81%) lower than that of the DV, while the average total operating cost of the EV was HK\$2.53/km (86%) lower than that of the DV.

5.3 The utilization rates of the EV and the DV were 100% and 99%, respectively. There was no indication of deterioration in the EV performance.

5.4 The driver of the EV had no problem in operating the vehicle and was satisfied with its performance.

5.5 The findings only reflect the performance of the EV in the first six 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 and EV Charging Facility

1. Trial EV and the EV Charging Facility

(a) EV

Registration mark:	XD5368
Make:	DFSK
Model:	EC35
Class:	Light goods vehicle
Gross vehicle weight:	2,330 kg
Seating capacity:	Driver + 4 passengers
Rated power:	30 kW
Driving range:	300 km (air conditioning off)
Battery material:	Lithium-ion
Battery capacity:	41.4 kWh
Year of manufacture:	2020

(b) EV Charging Facility

Make:	SKYTEC
Model:	BS-B20-BA-7.2kW
Type:	Single Phase 220V / 32A
Power:	7.2kW, AC
Charging standard:	IEC62196 Type 2

2. DV Used for Comparison

Registration mark	NP3382
Make:	Toyota
Model:	KDH201RSSPDY
Class:	Light goods vehicle
Gross vehicle weight:	2,800 kg
Seating capacity:	Driver + 5 passengers
Cylinder capacity:	2,982 cc
Year of manufacture:	2008

Appendix 2: Photos of Vehicles and Charging Facility

1. Trial EV and EV Charging Facility

	
Front view of EV	Rear view of EV
	
Left side view of EV	Right side view of EV
	
7.2 kW AC charging facility	

2. DV for Comparison



Front view of DV



Rear view of DV



Left side view of DV



Right side view of DV