Pilot Green Transport Fund

Interim Report
On
Trial of Electric Light Goods Vehicle for Vehicle Maintenance Parts Transportation Service (Kamwai Tyre Service Limited)

(16 May 2022)

PREPARED BY:
Dr. C. Ng

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
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Interim Report
(Trial Period: 1 May 2021 – 30 April 2022)

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 twelve 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. Designated drivers were 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 drivers were collected 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 – 30 April 2022)

		EV	**DV**
Total distance travelled (km)		13,012	2,229
Average daily distance travelled (km/working day)		44	8
Average fuel economy	(km/kWh)	3.36	-
	(km/litre)	-	7.35
	(km/MJ)	0.93	0.20 [1]
Average fuel cost (HK$/km) [2]		0.37	2.34
Average total operating cost (HK$/km)		0.37	2.93
Downtime (working day) [3]		1	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 12 months of the trial, there were 296 working days. The total distance travelled and the average daily distance travelled of the EV were 13,012 km and 44 km/day, respectively while those of the DV were 2,229 km and 8 km/day, respectively. The average fuel cost of the EV was HK$1.97/km (84%) lower than that of the DV. Taking maintenance fee into account, the average total operating cost of the EV was HK$2.56/km (87%) lower than that of the DV.

4.3 Both the EV and the DV had 1 working day downtime due to a scheduled maintenance, the utilization rate of the EV and the DV were therefore both 99.7%. In addition, there was no indication of deterioration in the EV performance.

4.4 The operation of the EV was smooth. The EV drivers had no problem in operating the EV and considered it was clean and quiet. The drivers and Kamwai were satisfied with the EV performance.

5. Summary

5.1 In the first twelve months of the trial, the average daily distance travelled of the EV and DV were 44 km and 8 km, respectively.

5.2 The EV had a better fuel economy than the DV. The average fuel cost of the EV was HK$1.97/km (84%) lower than that of the DV, while the average total operating cost of the EV was HK$2.56/km (87%) lower than that of the DV.

5.3 The utilization rates of the EV and the DV were both 99.7%. There was no indication of deterioration in the EV performance.

5.4 The drivers had no problem in operating the EV and considered it was clean and quiet. Kamwai was also satisfied with the EV performance in general.

5.5 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 and EV Charging Facility

1. Trial EV and 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 EV Charging Facility

1. Trial EV and EV Charging Facility

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<tr><td>Front view of EV</td><td>Rear view of EV</td></tr>
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<tr><td>Left side view of EV</td><td>Right side view of EV</td></tr>
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<tr><td>7.2 kW AC charging facility</td><td></td></tr>
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2. DV for Comparison

	
Front view of DV	Rear view of DV
	
Left side view of DV	Right side view of DV