

Pilot Green Transport Fund

Interim Report

On

Trial of Electric Light Goods Vehicle

for Transportation Industry

(Wah Fat Transportation Company)

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

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**Trial of Electric Light Goods Vehicle for Transportation Industry
(Wah Fat Transportation Company)**

**Interim Report
(Trial Period: 1 March 2020 – 28 February 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. Wah Fat Transportation Company (Wah Fat) was approved under the Fund for trial of one electric light goods vehicle (EV) to deliver noodles products from a local noodles manufacturer's warehouse in Yuen Long to various retail shops, restaurants, canteens, etc. all over Hong Kong. Through the tendering procedure stipulated in the Agreement entered into with the Government, Wah Fat procured one Joylong EW5 electric light goods vehicle (EV) for the 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. Wah Fat assigned a Toyota Hiace diesel light goods vehicle (DV) which provides similar service as the conventional counterpart, for comparing with the EV.

1.3 This Interim Report summarizes the performance of the EV in the first 12 months of the trial as compared with the DV.

2. Trial and Conventional Vehicles

2.1 Key features and photos of the EV, the charging facility and the DV are provided in Appendix 1 and Appendix 2, respectively. There were no fixed daily routes for the two monitored vehicles. The daily distance travelled by each vehicle varies from day to day, with routes covering the whole area of Hong Kong. In the first 12 months of the trial, the average working daily mileage of the EV and DV were 105 km and 61 km respectively.

2.2 There was no designated driver for the EV. After finishing the transportation service, the driver would drive the EV back to the warehouse in Yuen Long. The EV is parked in the car park next to the warehouse, and is charged with a portable 30 kW DC charger there at night.

3. Trial Information

3.1 The trial commenced on 1 March 2020 and will last for 24 months. Wah Fat 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. Similar data of the DV were also required. In addition to the cost information, reports on maintenance work, operational difficulties and opinions of the drivers and Wah Fat were collected and provided to reflect any problems of the EV.

4. Findings of Trial

4.1 The following table summarizes the statistical data of the EV and DV.

Table 1: Key operation statistics of the vehicles (March 2020 to February 2021)

Items	EV	DV ^[5]
Total mileage (km)	31,635	18,377
Average fuel economy	4.75 km/kWh	9.83 km/litre
	1.32 km/MJ	0.27 km/MJ ^[4]
Average fuel cost (HK\$/km) ^[1]	0.26	1.45
Average total operating cost (HK\$/km) ^[2]	0.26	1.45
Downtime (working day) ^[3]	0	0

^[1] The market fuel price was used for calculation.

^[2] Maintenance due to incident not related to the performance of the vehicle was not included for comparing the performance.

^[3] 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.

^[4] Assuming lower heating value of 36.13 MJ/litre for diesel fuel.

^[5] The DV was scrapped in February 2021, hence the data was up to January 2021.

4.2 In the first 12-month trial period, the average fuel cost of the EV was lower than that of the DV by HK\$1.19/km (82%). As there was no the maintenance, the average total operating cost of the EV was HK\$1.19/km (82%) lower than that of the DV.

4.3 There were 301 working days in the first 12 months of the trial. There was no operation downtime arising from maintenance in this period. The utilization rates of both the EV and the DV were 100%. There was no indication on deterioration of the EV.

4.4 The drivers had no problem in operating the EV and were very satisfied with its performance, in particular the faster acceleration and quieter in operation. Also, the air-conditioning system of the EV could be turned on during the idling period as it has no air pollutant emission.

4.5 Wah Fat was also satisfied with the EV performance. From April 2020 to July 2020, Wah Fat's business was affected by COVID-19 pandemic. During this difficult time, Wah Fat only needed to operate one light goods vehicle instead of two. Wah Fat preferred to operate the EV rather than the DV due to much lower fuel cost of the EV. In June 2020, Wah Fat had not operated the DV and only used the EV for the whole month.

5. Summary

5.1 In the first 12-month trial period, the average fuel cost of the EV was lower than that of the DV by HK\$1.19/km (82%). As there was no maintenance, the average total operating cost of the EV was HK\$1.19/km (82%) lower than that of the DV.

5.2 There were 301 working days in the first 12 months of the trial. The utilization rates of both the EV and the DV were 100%. There was no indication on deterioration of the EV.

5.3 Overall, the drivers had no problem in operating the EV and were very satisfied with its performance, in particular the provision of air-conditioning during idling period, the faster acceleration and quieter in operation. Wah Fat was also satisfied with the EV's performance and preferred to use the EV rather than the DV since the EV has a much lower fuel cost.

5.4 The findings only reflect the performance of the EV in the first 12 months of the trial. The performance and reliability of the EV will be continuously monitored in this 24-month trial.

Appendix 1: Key Features of the Vehicles and Charging Facility Involved in the Trial

(a) Trial EV and Charging Facility

EV

Registration mark	WH2092
Make:	Joylong
Model:	EW5
Class:	Light Goods Vehicle
Gross vehicle weight:	4,300 kg
Seating capacity:	Driver + 4 passengers
Rated power:	100 kW
Travel range:	330 km
Maximum speed:	120 km per hour
Battery material:	Lithium nickel cobalt manganese oxide
Battery capacity:	73 kWh
Year of manufacture:	2019

Charging Facility

Make:	Only Power Supply
Model:	ANDC5-500V/60A-1
Type:	3-phase, 380V, movable type
Output Power:	30kW
Output voltage:	500V DC
Maximum output current:	60A DC
Format:	Single charging gun

(b) DV for Comparison

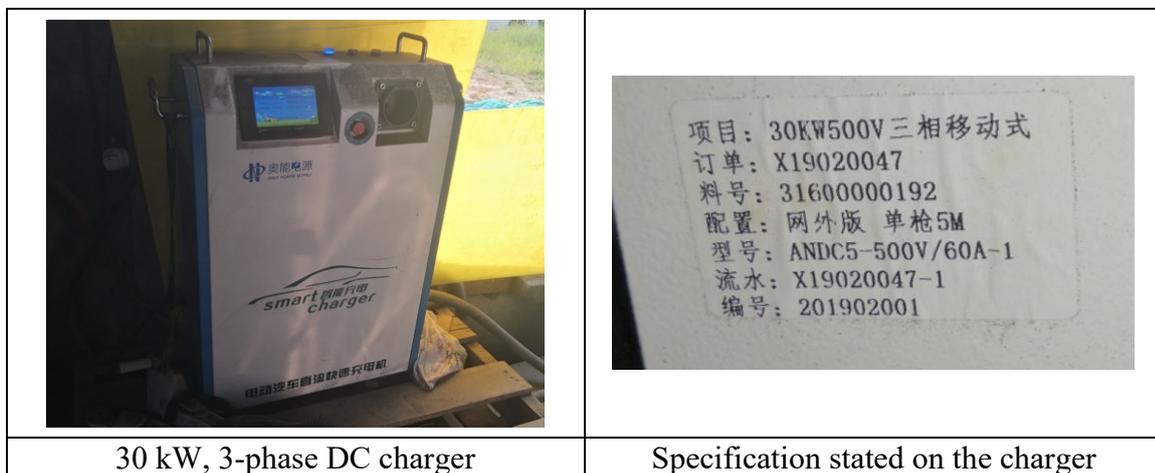
Registration mark	VR6968
Make:	Toyota
Model:	Hiace
Class:	Light Goods Vehicle
Gross vehicle weight:	2,800 kg
Seating capacity:	Driver + 5 passengers
Cylinder capacity:	2,982 cc
Year of manufacture:	2008

Appendix 2: Photos of Vehicles and the Charging Facility

(a) Trial EV



Charging Facility



(b) DV for comparison



Front view



Rear view



Right side view



Left side view