Pilot Green Transport Fund

Interim Report

On
Trial of Electric Light Good Vehicle for Vehicle Maintenance Services (DT Group (HK) Limited)

(21 June 2021)

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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 Vehicle Maintenance Services
(DT Group (HK) Limited)

Interim Report
(Reporting Period: 1 February 2020 – 31 January 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. DT Group (HK) Limited (DT) was approved under the Fund for trial of one electric light goods vehicle to deliver the vehicle maintenance tools and materials among its site office, warehouse of suppliers and a number of clients' sites in different areas of Hong Kong. Through the tendering procedure stipulated in the Agreement signed with the Government, DT procured a DFSK EC35 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. DT assigned a Toyota Hiace diesel light goods vehicle (DV) which provided similar services as the conventional counterpart for comparing with the EV. However, the DV was scrapped before the commencement of the EV, therefore, DT has provided 2-year DV historical data (September 2017 ~ August 2019) for comparison with the EV. For comparison purpose, the market fuel price in the trial period would be used for calculation.

1.3 This Interim Report summarizes the performance of the EV in the first 12 months of the trial and compared it with the historical data of its conventional counterpart, i.e. the DV.

2. Trial and Conventional Vehicles

2.1 Key features and photos of the EV, the EV charging facility and the DV are provided in Appendix 1 and Appendix 2, respectively. As the nature of the delivery for the vehicle maintenance tools and materials, there were no fixed daily routes for the two vehicles. In the first 12 months of the trial, the average daily (working day) mileage by the EV was about 22 km while that of the DV was 97 km. Low average daily usage of the EV might be due to the COVID-19 pandemic.

2.2 The EV had no designated driver. The EV was charged with a 7 kW DC charging facility (at DT's own cost) installed at DT's site office car-park in Yuen Long overnight.

3. Trial Information

3.1 The trial commenced on 1 February 2020 and would last for 24 months. DT was required to collect and provide trial information including the vehicle mileage reading before recharging, amount of energy in each recharging, 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 DT 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 the DV.

Table 1: Key operation statistics of the vehicles (1 February 2020 to 31 January 2021)

Items	**EV**	**DV**
Total distance travelled (km)	6,682	28,927
Average daily distance travelled (km/day)	22	97
Average fuel cost (HK$/km) [1]	0.38	1.11
Average fuel economy (km/MJ)	0.89	0.36 [4]
Average total operating cost (HK$/km) [2]	0.66	1.24
Downtime (working day) [2][3]	0	1.5

[1] The market fuel prices in the period of February 2020 – January 2021 were 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

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$0.73/km (i.e., about 66%). Taking into account the maintenance cost in the period, the average total operating cost of the EV was lower than that of the DV by HK$0.58/km (i.e., about 47%).

4.3 There were 299 working days in the first 12 months of the trial. Both the EV and the DV had no unscheduled maintenance. The utilization rate of the EV was 100% as there was no downtime due to simple scheduled maintenances, while the utilization rate of the DV was 99.5% as there were 1.5 days of downtime due to 3 scheduled maintenances.

4.4 The drivers had no difficulty in operating the EV, but they had to well plan the trips every day due to the limited driving range. The drivers were quite satisfied with the performance of the EV, especially that (a) the air-conditioning system of the EV could be turned on during the idling period of the EV; (b) it was fast in acceleration; and (c) it was quiet in operation. DT was satisfied with the performance of the EV, especially on saving in fuel cost.

5. Summary

5.1 During the first 12 months of the trial, the average fuel cost of the EV was lower than that of the DV by HK$0.73/km (i.e., about 66%). Taking into account the maintenance, the average total operating cost of the EV was lower than that of the DV by HK$0.58/km (i.e., about 47%). The utilization rates of the EV and the DV were 100% and 99.5% respectively.

5.2 The driver had no problem in operating the EV and was quite satisfied with its performance, except on the limited driving range. DT was also satisfied with the performance of the EV.

5.3 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 the Vehicles and Charging Facility

1. Trial EV and Charging Facility

(a) EV

Registration mark	**DONGFENG**
Make:	DFSK (東風小康)
Model:	EC35
Class:	Light Goods Vehicle
Gross vehicle weight:	2,330 kg
Seating capacity:	Driver + 4 passengers
Rated power:	30kW
Travel range:	300 km (air conditioning off)
Battery material:	Lithium-ion
Battery capacity:	41.4 kWh
Year of manufacture:	2019

(b) Charging Facility (At the Subsidy Recipient's Own Cost)

Make:	深圳市金霆新能源技術有限公司
Model:	JTEV-DC/7
Type:	GB/T18487.1-2015
Input Voltage:	Single-phase, 220V
Rated Power:	7kW DC

2. DV Used for Comparison

Registration mark	**DONGFENG**
Make:	Toyota
Model:	Hiace KDH200RSSMDY
Class:	Light Goods Vehicle
Seating capacity:	Driver + 5 passengers
Gross vehicle weight:	2,800 kg
Cylinder capacity:	2,494 cc
Year of manufacture:	2005

Appendix 2: Photos of Vehicles and Charging Facility

1. Trial EV and Charging Facility

(a) Trial EV

	
Front view	Rear view
	
Right side view	Left side view

(b) Charging Facility (At the Subsidy Recipient's Own Cost)

	
Charging Facility	Specification of Charger
	
Power Meter	

2. DV Used for Comparison

	
Front view	Rear view
	
Right side view	Left side view